

Strategies To Improve Mental Health Care for Children and Adolescents



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Preface

The Agency for Healthcare Research and Quality (AHRQ), through its Evidence-based Practice Centers (EPCs), sponsors the development of systematic reviews to assist public- and private-sector organizations in their efforts to improve the quality of health care in the United States. These reviews provide comprehensive, science-based information on common, costly medical conditions, and new health care technologies and strategies.

Systematic reviews are the building blocks underlying evidence-based practice; they focus attention on the strength and limits of evidence from research studies about the effectiveness and safety of a clinical intervention. In the context of developing recommendations for practice, systematic reviews can help clarify whether assertions about the value of the intervention are based on strong evidence from clinical studies. For more information about AHRQ EPC systematic reviews, see www.effectivehealthcare.ahrq.gov/reference/purpose.cfm.

AHRQ expects that these systematic reviews will be helpful to health plans, providers, purchasers, government programs, and the health care system as a whole. Transparency and stakeholder input are essential to the Effective Health Care Program. Please visit the Web site (www.effectivehealthcare.ahrq.gov) to see draft research questions and reports or to join an email list to learn about new program products and opportunities for input.

If you have comments on this systematic review, they may be sent by mail to the Task Order Officer named below at: Agency for Healthcare Research and Quality, 5600 Fishers Lane, Rockville, MD 20857, or by email to epc@ahrq.hhs.gov.

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In designing the study questions, the EPC consulted several Key Informants who represent the end-users of research. The EPC sought the Key Informant input on the priority areas for research and synthesis. Key Informants are not involved in the analysis of the evidence or the writing of the report. Therefore, in the end, study questions, design, methodological approaches, and/or conclusions do not necessarily represent the views of individual Key Informants.

Key Informants must disclose any financial conflicts of interest greater than \$10,000 and any other relevant business or professional conflicts of interest. Because of their role as end-users, individuals with potential conflicts may be retained. The TOO and the EPC work to balance, manage, or mitigate any conflicts of interest.

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Strategies To Improve Mental Health Care for Children and Adolescents

Structured Abstract

Objectives. To assess the effectiveness of quality improvement, implementation, and dissemination strategies that seek to improve the mental health care of children and adolescents; to examine harms associated with these strategies; and to determine whether effectiveness or harms vary in subgroups based on system, organizational, practitioner, or patient characteristics.

Data sources. Searches from inception through January 14, 2016, of MEDLINE®, Cochrane Library, PsycINFO®, CINAHL® (Cumulative Index to Nursing and Allied Health Literature), and gray literature; additional studies from reference lists and study authors.

Review methods. Dual selection, data extraction, and risk of bias assessment of relevant trials and observational studies, followed by analysis, synthesis, and grading the strength of evidence for each outcome. We also employed qualitative comparative analysis (QCA) to examine set relationships between combinations of strategy components and improvements in outcomes.

Results. We found 17 studies testing overall effectiveness of 16 strategies, of which 1 reported on harms and 4 on moderators of effectiveness. The evidence base includes 13 randomized controlled trials (RCTs), 2 controlled clinical trials, 1 cohort, and 1 interrupted time series. The strategies included in this review were complex and heterogeneous. We found 7 studies (6 strategies) that comprised only professional components and 10 studies (10 strategies) that consisted of one or more financial or organizational components, although many of these included professional components as well. Twelve studies included multiple active components; 5 had a single active component.

We found evidence that a majority of strategies had at least some evidence of effectiveness. Twelve studies (11 strategies) had at least one outcome rated as low for benefit. We graded the strength of evidence of one outcome for one strategy as moderate: one RCT reported that provider financial incentives improve practitioner implementation competence. Our QCA revealed inconsistent evidence on strategies with educational meetings, materials, and outreach: these strategies appeared to be successful in combination with reminders or providing practitioners with newly collected clinical information. We also found low strength of evidence of no benefit for strategies that included educational materials only, educational meetings only, educational materials and meetings only, and educational materials and outreach components only.

We were unable to judge the overall potential for harms associated with these strategies that may mitigate benefits based on the single included study with information on harms. The available evidence from four studies on two moderators does not permit us to make general conclusions about the conditions under which these strategies might work optimally.

Conclusions. Our findings suggest that several approaches can improve both intermediate and final health outcomes and resource use. Twelve of the 17 included studies (11 of the 16 strategies) significantly improved at least one such outcome or measure. The evidence does not permit us to have a high degree of confidence about the efficacy of any one strategy because we generally found a single study testing each strategy. We found inconsistent evidence involving strategies with educational meetings, materials, and outreach; programs appeared to be successful in combination with reminders or providing practitioners with newly collected clinical

information. We also found low strength of evidence for *no* benefit for initiatives that included only educational materials or meetings (or both) or only educational materials and outreach components.

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Executive Summary

Background

Approximately one in five children and adolescents living in the United States has one or more mental, emotional, or behavioral health disorders according to the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* (DSM-IV) criteria in any given year.¹ These disorders contribute to problems with family, peers, and academic functioning. They may exacerbate coexisting conditions and may reduce quality of life. They also increase the risk of involvement with the criminal justice system and other risk-taking behaviors and suicide.²

Several key publications in the mid- to late 1990s suggested that usual care in children's mental health had, at best, no³ and sometimes harmful effects.⁴ Since then, mental health interventions that improve children and adolescents with mood disorders, anxiety disorders, disruptive behavior disorders, psychotic disorders, eating disorders, and substance use disorders have been tested to varying degrees of benefit.^{5,6}

Despite advances in the evidence base,^{5,7} some outcomes for children with mental health problems remain suboptimal because of issues with access to care and the failure of systems and providers to adopt established quality improvement (QI) strategies and interventions with proven effectiveness (e.g., evidence-based practices [EBPs]). Studies using nationally representative data on U.S. adolescents show that only approximately one in five children with mental health problems receives services, and only one-third of treatment episodes are considered minimally adequate (at least four visits with psychotropic medication or at least eight visits without psychotropic medication).⁸⁻¹⁰ The current health care system continues to provide fragmented care to children and adolescents in numerous uncoordinated systems, rendering inefficient the delivery of needed services.¹¹ Moreover, clinicians—particularly primary care practitioners—may lack the time, knowledge, or training to identify and treat or refer patients with mental health problems.¹²

Given the gap between observed and achievable processes and outcomes, one way to improve the mental health care of children and adolescents is to adopt QI strategies and develop strategies to implement or disseminate interventions with known effectiveness. Such strategies target changes in the organization and delivery of mental health services.^{13,14} They seek to improve the quality of care and patient outcomes by closing the gap between research evidence and practice.¹⁵⁻¹⁷

The ultimate goal of these strategies is to improve patient health and service utilization outcomes for children and adolescents with mental health problems. Intermediate outcomes in this context include changes to health care systems, organizations, and practitioners that provide mental health care. Targeting multiple, interrelated, nested levels such as the macro environment (e.g., state), organization or system (e.g., specialty mental health clinic), program (e.g., selected intervention), practitioners (e.g., clinicians), and patients (e.g., children or adolescents and their families) typically increases the effectiveness and sustainability of a particular strategy.^{18,19} For instance, changes in intermediate outcomes such as practitioners' attitudes²⁰ or organizational climate²¹ may influence the successful adoption of and fidelity to EBPs. These practices in turn influence patient health outcomes, such as behavior or quality of life.

Scope and Key Questions

Key Questions (KQs)

KQ 1: What is the effectiveness of QI, implementation, and dissemination strategies employed in outpatient settings by health care practitioners, organizations, or systems that care for children and adolescents with mental health problems to improve:

- a. intermediate patient, provider, or system outcomes
- b. patient health and service utilization outcomes?

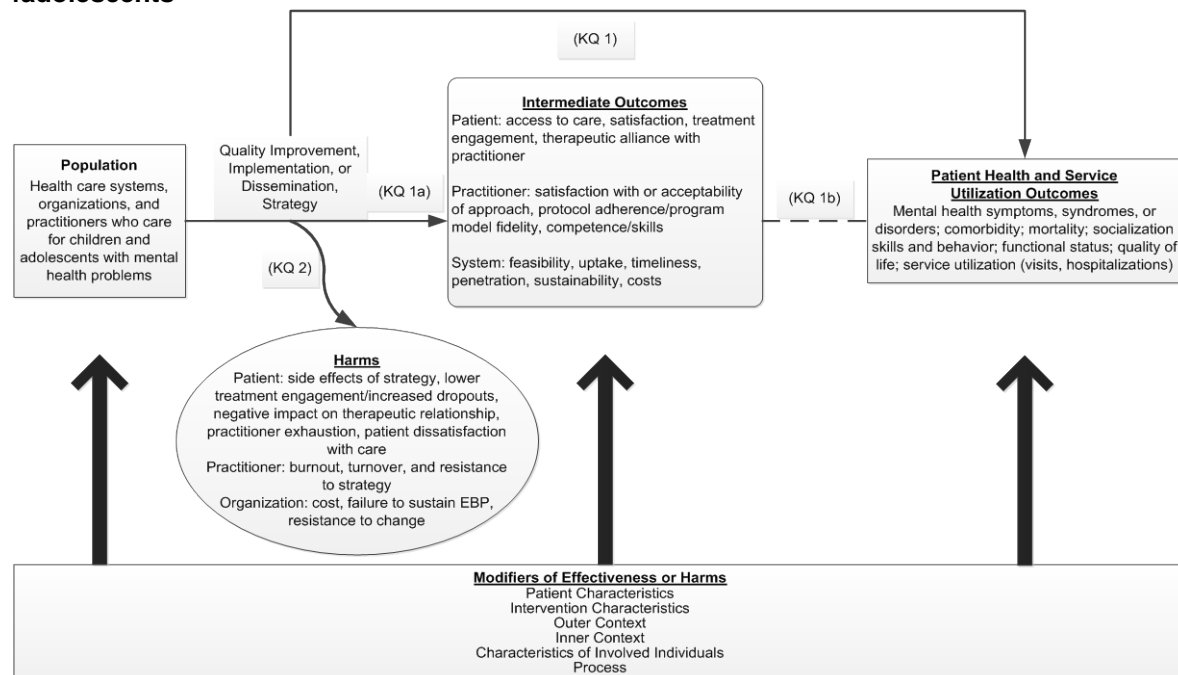
KQ 2: What are the harms of these mental health strategies?

KQ 3: Do characteristics of the child or adolescent or contextual factors (e.g., characteristics of patients, practitioners, organizations, or systems; intervention characteristics; setting; or process) modify the effectiveness or harms of strategies to improve mental health care and, if so, how?

Analytic Framework

Figure A depicts the patient populations, interventions, comparators, outcomes, and timing of outcomes assessment (PICOTs) and KQs in relation to these PICOTs.

Figure A. Analytic framework for strategies to improve mental health care in children and adolescents



EBP = evidence-based practices; KQ = Key Question.

Populations, Interventions, Comparators, Outcomes, Timing, and Setting

We specified our inclusion and exclusion criteria based on the PICOTS early in the systematic review process after conducting a literature scan and receiving input from key informants. We included QI, implementation, and dissemination strategies that targeted systems, organizations, or practitioners of mental health care to children and adolescents 18 years of age or younger, who were already experiencing mental health symptoms. As a result, universal interventions aimed at prevention are not included. We did not include strategies such as the implementation of educational interventions for reading disorders. We also limited our review of implementation strategies to those focusing on EBP interventions. For defining EBPs, we relied on the minimum requirements set forth by the Substance Abuse and Mental Health Services Administration's National Registry of Evidence-based Programs and Practices (www.nrepp.samhsa.gov). These criteria specify that the intervention needs to have produced one or more positive behavioral outcomes in at least one study using an experimental or quasi-experimental design with results published in a peer-reviewed journal or similar publication. In addition, implementation materials, training and support resources, and quality assurance procedures for these interventions need to be ready for use by the public.

We use the term “strategy” to reference the total sum of components used to target health care systems and/or practitioners to improve the quality of care for children and adolescents with mental health problems. We use the term “intervention” to denote a specific EBP used as part of a strategy.

Because strategies tended to be complex in nature and the number and types of components that varied between the treatment arm and comparison group arm differed by study, we also recorded components of each strategy. We relied on the Cochrane Review Group's Effective Practice and Organisation of Care (EPOC) Group taxonomy, which categorizes strategies by whether they include one or more professional, financial, organizational, and regulatory components.²² Because many of the comparison groups also contained several components, we marked the components contained in each study arm of each study. This allowed us to fully describe the numerous components that were being combined and tested in each strategy, as well as enabled us to determine whether the study arms differed by a single or multiple components.

We required each included study to report at least one intermediate outcome in a minimum of one of three major categories: (1) practitioner intermediate outcomes (satisfaction, adherence, fidelity, competence), (2) system intermediate outcomes (feasibility, uptake, timeliness, penetration, sustainability, costs), and (3) patient intermediate outcomes (access to care, satisfaction, engagement, therapeutic alliance). This approach helped ensure that each included study demonstrated impact based on its stated goals of improving quality or implementing or disseminating evidence-based interventions. We also required each study to report at least one patient health or service utilization outcome (change in mental health status, comorbid conditions, mortality, socialization skills and behavior, functional status, quality of life, service utilization) if the strategy was not implementing or disseminating an EBP (i.e., an intervention with proven effectiveness).

For all KQs, we excluded study designs without comparison groups to ensure that our pool of included studies provided strong evidence on the causal link between the strategy and outcomes. We also required that the comparator enabled examination of the strategy effectiveness. That is, we excluded studies in which the strategy (system, organizational, practitioner targets) and the intervention being tested both differed between groups, because the effectiveness of the QI,

implementation, or dissemination strategy could not be isolated from the baseline intervention effects.

Our exclusion of non-English-language studies is based on limitations of time and resources. However, we examined English language abstracts of non-English-language studies to assess the potential size of the literature that would be missed through this approach.

Methods

The methods for this systematic review follow the *Methods Guide for Effectiveness and Comparative Effectiveness Reviews* from Agency for Healthcare Research and Quality (AHRQ) (available at <http://www.effectivehealthcare.ahrq.gov/methodsguide.cfm>). The review uses the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) checklist to facilitate the preparation and reporting of the systematic review.²³

Topic Refinement and Protocol Review

We developed this topic and KQs through a public process. AHRQ nominated the topic and we developed and refined it. Initially, a panel of Key Informants gave input on the KQs to be examined; AHRQ then posted these questions on the Effective Health Care Website for public comment from September 15, 2014, through October 6, 2014. We revised the KQs in response to comments.

We then drafted a protocol for the systematic review and recruited a panel of technical experts to provide high-level content and methodological expertise throughout the development of the review. The final protocol was posted on the Effective Health Care website at <http://effectivehealthcare.ahrq.gov/search-for-guides-reviews-and-reports/?pageaction=displayproduct&productid=2030> on December 30, 2014, and registered on PROSPERO (Registration number: CRD42015024759). Following release of our draft report and peer review, we amended our protocol to include additional review and analysis strategies suitable for complex interventions (described under “Data Synthesis”).

Literature Search Strategy

We systematically searched, reviewed, and analyzed the scientific evidence for each of our three KQs. We began with a focused MEDLINE[®] search for eligible interventions using a combination of medical subject headings (MeSH[®]) and title and abstract keywords, limiting the search to human-only studies (from inception through January 14, 2016). We also searched the Cochrane Library, PsycINFO[®], and CINAHL[®] (Cumulative Index to Nursing and Allied Health Literature) using analogous search terms.

In addition, we searched the gray literature (information that is unpublished and not controlled commercially) for studies relevant to this review and included studies that met all the inclusion criteria and contain enough methodological information to assess risk of bias. Sources of gray literature include ClinicalTrials.gov, the World Health Organization’s International Clinical Trials Registry Platform, the National Institutes of Health Research Portfolio Online Reporting Tools, the Database of Promoting Health Effectiveness Reviews, and CMS.gov. To avoid retrieval bias, we manually searched the reference lists of landmark studies and background articles on this topic to look for any relevant citations that our electronic searches might have missed.

Trained reviewers abstracted important information from included studies into evidence tables, housed on AHRQ's Systematic Review Data Repository. A second senior member of the team reviewed all data abstractions for completeness and accuracy. Reviewers resolved conflicts by discussion and consensus or by consulting a third member of the review team.

Risk of Bias Assessment

To assess the risk of bias (internal validity) of studies, two independent reviewers used predefined, design-specific criteria based on guidance in the *Methods Guide*.²⁴ We resolved conflicts by consensus or by consulting a third member of the team. For randomized controlled trials (RCTs), we relied on the risk of bias tool developed by the Cochrane Collaboration.²⁵ We assessed the risk of bias of observational studies using questions from an item bank developed by RTI International²⁶ and A Cochrane Risk Of Bias Assessment Tool for Non-Randomized Studies of Interventions (ACROBAT-NRSI).²⁷ Minimum eligibility criteria for systematic reviews included an explicit description of search strategy used and determination that the search strategy was adequate, application of predefined eligibility criteria and risk of bias assessment for all included studies, and synthesis of the results presented.

In general terms, a study with no identifiable flaws has a low risk of bias. A study with medium risk of bias is susceptible to some bias but probably not sufficient to invalidate its results. A study with high risk of bias has significant methodological flaws (stemming from, for example, serious errors in design or conduct) that may invalidate its results. We considered the risk of bias for each relevant outcome of a study. When studies did not report sufficient detail to assess the validity of the design or study conduct, we judged the risk of bias to be unclear.

Data Synthesis

To determine whether quantitative analyses were appropriate, we assessed the clinical and methodological heterogeneity of the studies under consideration following established guidance.²⁸ For all outcomes, we present relative risks or mean differences, with confidence intervals (CIs), whenever calculable. For outcomes with multiple measures, we present forest plots.

We employed several other methods to provide additional information about the nature of the strategies tested and what components of the strategies had the most impact on outcomes. First, we performed additional search approaches of related publications (known as “cluster searching”) to identify sibling (multiple publications on the same study) or kinship studies (publications from a common antecedent study or common theoretical foundation).²⁹ We hoped to uncover contextual information to explain failure or success of strategies. We also contacted study authors to obtain information about critical components for strategies of included studies as part of a parallel project to better understand the uses and limitations of trial registries for data on outcomes. This effort provided additional information on the important components of the strategies tested in included studies. Finally, we used qualitative comparative analysis (QCA) to examine set relationships between combinations of strategy components to identify those that were most associated with improvements in outcomes.

Strength of the Body of Evidence

We graded the strength of a body of evidence based on the updated guidance in the *Methods Guide*.^{30,31} The AHRQ EPC approach incorporates five key domains: study limitations,

consistency, directness, precision of the evidence, and reporting bias. It also considers other optional domains that may be relevant for some scenarios, such as a dose-response association, plausible confounding that would decrease the observed effect, and strength of association (magnitude of effect). These domains are particularly relevant for observational studies.

Two reviewers assessed each domain for each key outcome and resolved any differences by consensus discussion. Senior members of the review team graded the strength of evidence.

Grades reflect the confidence that the reviewers have that various estimates of effect are close to true effects with respect to the KQs in a systematic review. Table A defines the four grades.

Table A. Definitions of the grades of overall strength of evidence³⁰

Grade	Definition
High	We are very confident that the estimate of effect lies close to the true effect for this outcome. The body of evidence has few or no deficiencies. We believe that the findings are stable (i.e., another study would not change the conclusions).
Moderate	We are moderately confident that the estimate of effect lies close to the true effect for this outcome. The body of evidence has some deficiencies. We believe that the findings are likely to be stable, but some doubt remains.
Low	We have limited confidence that the estimate of effect lies close to the true effect for this outcome. The body of evidence has major or numerous deficiencies (or both). We believe that additional evidence is needed before concluding either that the findings are stable or that the estimate of effect is close to the true effect.
Insufficient	We have no evidence, we are unable to estimate an effect, or we have no confidence in the estimate of effect for this outcome. No evidence is available or the body of evidence has unacceptable deficiencies, precluding reaching a conclusion.

Risk of bias assessments for individual studies feed into the rating for the first of the strength of evidence domains, study limitations. Specifically, we rated bodies of evidence comprising trials with a high risk of bias as having high study limitations. Medium or unclear risk of bias studies resulted in medium study limitations. Low risk of bias studies resulted in low study limitations. In keeping with GRADE and strength of evidence guidance, we rated observational studies as having high study limitations.^{31,32}

As described above, study design and study limitations together set the baseline strength of evidence grade. Other domains then could either reduce or increase the grade. A body of evidence with high study limitations, with no other reasons to increase confidence (dose-response, large magnitude of effect, plausible confounding) or decrease it (inconsistency, imprecision, indirectness, reporting bias) would generally have a low strength of evidence grade. A body of evidence with low study limitations, with no reasons to decrease confidence (inconsistency, imprecision, indirectness, reporting bias), would generally have a high strength of evidence grade. In other words, although study design and study limitations provide a baseline judgment of strength of evidence, each of four additional sources of uncertainty (inconsistency, imprecision, indirectness, reporting bias) serve to further reduce the strength of evidence grade. For each source of uncertainty, we consistently used the following rubric to evaluate its effect on the overall strength of evidence across outcomes. Specifically, for indirectness, we rated intermediate outcomes as direct, rather than indirect, evidence. For this systematic review, these outcomes can be interpreted as direct measures of process change. Regarding consistency, we rated it as unknown for bodies of evidence with single studies; the rating of unknown consistency did not lower the overall grade. We relied on established guidance to judge

precision.³³ Regarding imprecision, we specified the reasons for our judgment (small sample size or event rate, particularly when considering the optimum information size for the specific outcome, CIs crossing the line of no difference, or very wide CIs).³² We downgraded the overall strength of evidence by two levels when we found multiple reasons for imprecision. We upgraded the evidence by one level for factors such as large magnitude of effect.

Applicability

We assessed applicability of the evidence following guidance from the *Methods Guide*.³⁴ We used the PICOTS framework to explore factors that affect applicability.

Results

We provide a summary of results by KQ below. Detailed descriptions of included studies, key points, detailed synthesis, summary tables, and expanded strength of evidence tables that include the magnitude of effect can be found in the full report. Our summary of results below presents the strength of evidence grades.

Results of Literature Searches

Figure B presents our literature search results through January 14, 2016. We found 17 eligible articles representing 17 studies^{13,14,35-49} (one article reports on two different studies⁴⁴ and another two articles^{40,49} report outcomes for the same trial). We did not find any relevant non-English studies with English abstracts upon review.

This evidence base for KQ 1 consisted of 17 studies.^{13,14,35-49} One of these studies addressed KQ 2 (harms) and four addressed KQ 3 (moderators of effectiveness). The evidence base included RCTs,^{13,14,35-37,39,40,42,44-49} controlled clinical trials (CCTs),^{41,43} interrupted time series,³⁸ and cohort designs.⁴⁴ Full evidence tables are available at <http://srdr.ahrq.gov/projects/530>.

We classified strategies with one or more financial or organizational components as “financial or organizational change” strategies and strategies with only professional components as “professional training” strategies. These categories guided our qualitative synthesis. We present summary tables of descriptions of strategy components and differences by study arms for each included study in the text of our main report. Table B presents study characteristics for professional training and financial or organizational change strategies.

Figure B. Results of literature searches

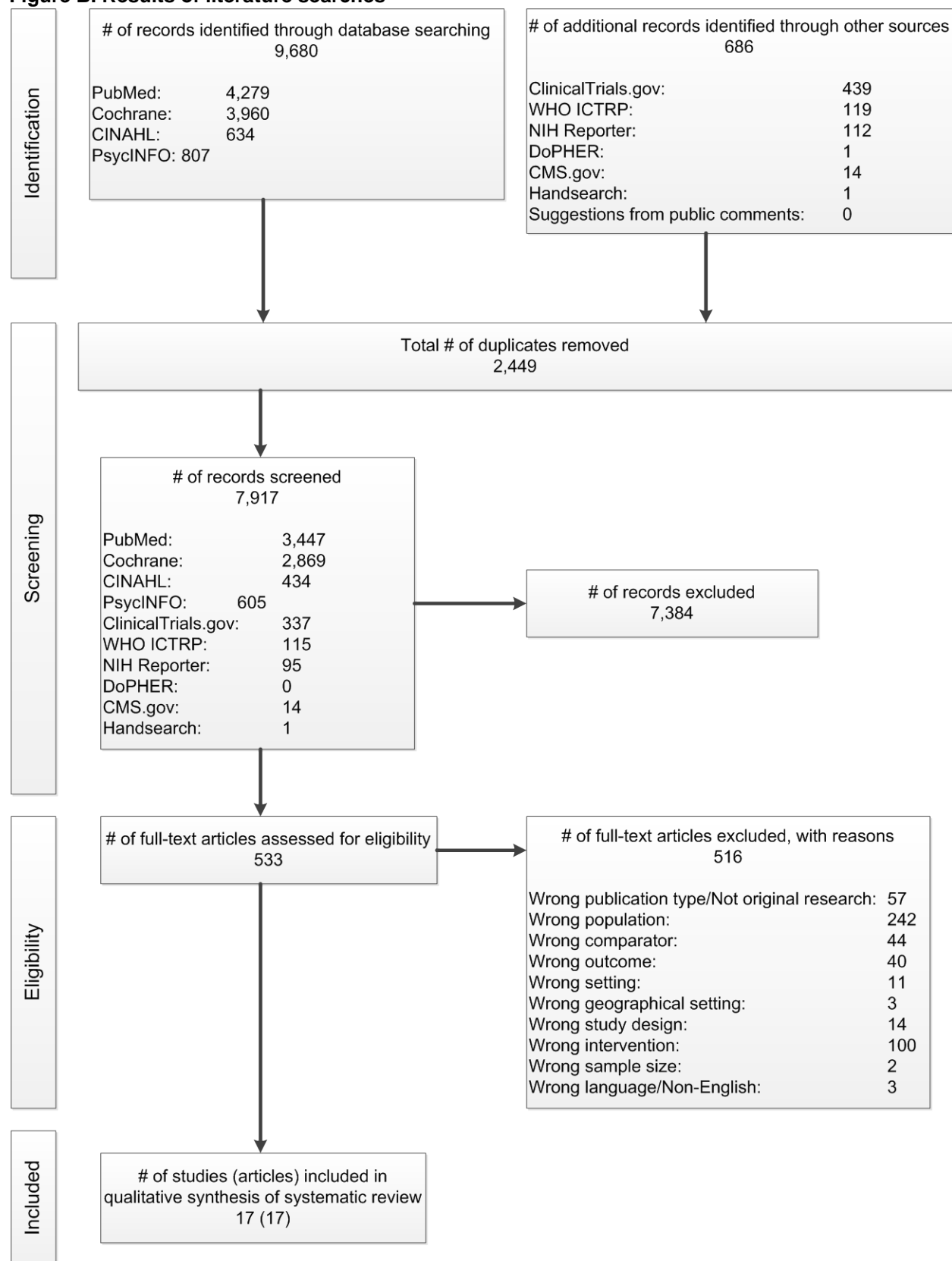


Table B. Strategies to improve mental health of children and adolescents: Study characteristics

Study Descriptor	Characteristics	Primary Strategy: Professional Training ^a	Primary Strategy: Financial or Organizational Change ^b	Total
Design	RCT	2	0	2
	2-stage RCT	0	1	1
	Cluster RCT	3	7	10
	CCT	0	2	2
	Non-RCT	2	0	2
Setting	Primary care	1	2	3
	Community mental health	4	8	12
	School	1	0	1
Strategy Categorization ^c	Quality improvement	2	3	5
	Implementation	1	4	5
	Dissemination	0	0	0
	Hybrid QI and I	1	2	3
	Hybrid QI and D	2	1	3
	Hybrid I and D	1	0	1
Risk of Bias	Low	1	0	1
	Medium	0	2	3
	High	3	3	6
	Unclear	3	3	7
Key Question	KQ 1	7	10	17
	KQ 2	1	0	1
	KQ 3	1	3	4
Total N of studies		7	10	17

^a Included all professional components from the EPOC taxonomy

^b Included at least 1 financial or organizational component from the EPOC taxonomy

^c Categories dually assigned by members of the study team according to the definitions of QI, I, and D included in the PICOTS

CCT = controlled clinical trial; D = dissemination; I = implementation; KQ = Key Question; N = number; QI = quality improvement; RCT = randomized controlled trial.

Below, we summarize the main findings. We then discuss the findings in relationship to what is already known, applicability of the findings, implications for decisionmaking, limitations, research gaps, and conclusions.

Key Findings and Strength of Evidence

Key Question 1. Effectiveness of Strategies To Improve Mental Health Care for Children and Adolescents

Table C describes interventions and summarizes the evidence for included studies. Most strategies were complex and included multiple (two to seven) different components (as defined by the EPOC taxonomy). We graded the strength of evidence of 28 outcomes for professional training strategies and of 19 for financial or organizational change strategies.

Table C. Strategies to improve mental health of children and adolescents: Summary table

Strategy, Study	Designs, N	Target Condition and Ages of Youth	Comparisons	Component of the Strategy	Major Findings	Strength of Evidence From Results	Reasons for Strength of Evidence
Adding an active learning component to a professional training workshop to implement an EBP Beidas et al., 2012 ³⁹	Cluster RCT, 115 therapists	Anxiety Ages 8–17 years	Augmented active learning vs. routine professional training workshop	Educational meetings or materials	No differences between arms for practitioner satisfaction with approach, protocol adherence, or practitioner skill	Low for no benefit for practitioner satisfaction, adherence, and skill	Low risk of bias, small sample size, imprecise results
			Computerized routine training vs. routine professional training workshop	Educational meetings or materials	No differences between arms for practitioner protocol adherence or program model fidelity, or skill; computerized training group practitioners less satisfied than routine training group practitioners	Low for no benefit for practitioner satisfaction, adherence, and skill	Low risk of bias, small sample size, imprecise results
Adding weekly feedback to practitioners regarding patient symptoms to practitioners Bickman et al., 2011 ¹³	Cluster RCT, N of clinicians unclear, 340 youth, 144 clinicians, 383 caregivers	General mental health problem (children who receive home-based mental health treatment) Mean age = 15 years	Weekly and cumulative 90-day feedback vs. cumulative 90-day feedback only on patient symptoms and functioning to practitioners	Audit and feedback	Two-thirds of practitioners did not view Web module	Insufficient for practitioner adherence	High study limitations, unknown precision for adherence
					Membership in the weekly feedback group increased the rate of decline in functional severity scale by 0.01 (range: 1 to 5, higher scores indicate greater severity)	Low for benefit for functional severity	High study limitations, precise results for symptoms

Table C. Strategies to improve mental health of children and adolescents: Summary table (continued)

Strategy, Study	Designs, N	Target Condition and Ages of Youth	Comparisons	Component of the Strategy	Major Findings	Strength of Evidence From Results	Reasons for Strength of Evidence
Adding diagnosis and treatment guidelines to a computer decision support system Carroll et al., 2013 ³⁵	Cluster RCT, 84 patients	General mental health problem (children who receive home-based mental health treatment) Mean age = 15 years	Computer decision support plus electronic health record (EHR) that included diagnosis and treatment guidelines vs. computer decision support plus EHR only	Educational meetings or materials Patient-reported data Reminders Quality monitoring	Practitioner adherence improved through uptake of guidelines for diagnostic assessment (aOR, 8.0; 95% CI, 1.6 to 40.6); more reporting of 3 of 4 symptom domains at diagnosis	Low for benefit for practitioner adherence and program model fidelity	Medium study limitations, imprecise results with small number of events, large magnitude of effect
					No statistically significant differences on practitioner adherence through reassessment of symptoms at 3 months, adjustment of medications, and mental health referral	Insufficient for practitioner adherence (reassessment of symptoms) at 3 months, adjustment of medications, and referral	Medium study limitations, imprecise results (CIs cross the line of no difference)
					Visit to a mental health specialist calculated OR: 2.195; 95% CI, 0.909 to 5.303; p=0.081; reported p-value in study=0.054	Insufficient for service utilization	Medium study limitations, imprecise results (CIs cross the line of no difference)

Table C. Strategies to improve mental health of children and adolescents: Summary table (continued)

Strategy, Study	Designs, N	Target Condition and Ages of Youth	Comparisons	Component of the Strategy	Major Findings	Strength of Evidence From Results	Reasons for Strength of Evidence
Providing practitioner access to practice guidelines via an Internet portal Epstein et al., 2011 ⁴⁵	Cluster RCT, 746 patients	Attention deficit hyperactivity disorder (ADHD) Ages 6 to 12 years	Internet portal providing practitioner access to practice guidelines vs. wait-list control	Educational meetings or materials Patient-reported data Audit and feedback Reminders Quality monitoring	Strategy appeared to improve 4 of 5 examined outcomes that measured practitioner protocol adherence and program model fidelity outcomes (mean change in proportion of patients who received targeted, evidence-based ADHD care outcomes between groups ranged from 16.6 to -50), but estimates were very imprecise, with large CIs	Low for benefit for practitioner protocol adherence and program model fidelity	Medium study limitations, imprecise (wide CIs)

Table C. Strategies to improve mental health of children and adolescents: Summary table (continued)

Strategy, Study	Designs, N	Target Condition and Ages of Youth	Comparisons	Component of the Strategy	Major Findings	Strength of Evidence From Results	Reasons for Strength of Evidence
Collaborative consultation to promote the use of titration trials and periodic monitoring during medication management Epstein et al., 2007 ³⁶	Cluster RCT, 38 practitioners, 144 patients	ADHD Mean age = 7 years	Collaborative consultation treatment service to promote the use of titration trials and periodic monitoring during medication management vs. control	Audit and feedback Multidisciplinary team	Practitioner adherence/fidelity as measured by use of titration trials $\beta = -0.283$; SE, 0.09; $p < 0.01$ and by use of medication monitoring trials: $p = \text{NS}$, details NR	Insufficient for practitioner adherence and fidelity	High study limitations, imprecise results (small sample size)
					Lower odds with overlapping confidence intervals of practitioner citing obstacles to implementation of EBP in 6 of 8 measures (2 reached statistical significance)	Insufficient for practitioner competence/skills	High study limitations, imprecise results (small sample size)
					F score for decrease in combined parent and teacher ratings of ADHD symptoms for group x time interaction: $F_{2, 144} = 0.44$, $p = 0.65$	Insufficient for patient change in mental health symptoms	High study limitations, imprecise results (small sample size)

Table C. Strategies to improve mental health of children and adolescents: Summary table (continued)

Strategy, Study	Designs, N	Target Condition and Ages of Youth	Comparisons	Component of the Strategy	Major Findings	Strength of Evidence From Results	Reasons for Strength of Evidence
Paying practitioners for performance in implementing an EBP Garner et al., 2012 ⁴²	Cluster RCT, 49 therapists, 936 patients	Substance use disorders Mean age = 16 years	Paying practitioners for performance in successfully delivering an EBP intervention vs. implementation as usual	Provider incentives	Therapists in the P4P group were over twice as likely to demonstrate implementation competence compared with IAU therapists (Event Rate Ratio, 2.24; 95% CI, 1.12 to 4.48)	Moderate for benefit for practitioner competence	Medium study limitations, precise results
					Patients in the P4P condition were more than 5 times as likely to meet target implementation standards (i.e., to receive specific numbers of treatment procedures and sessions) than IAU patients (OR, 5.19; 95% CI, 1.53 to 17.62)	Low for benefit for practitioner adherence and program fidelity	Medium study limitations, imprecise results (wide CIs)
					No statistically significant differences between groups OR, 0.68; 95% CI, 0.35 to 1.33	Low for no benefit for patient change in mental health symptoms	Medium study limitations, precise results

Table C. Strategies to improve mental health of children and adolescents: Summary table (continued)

Strategy, Study	Designs, N	Target Condition and Ages of Youth	Comparisons	Component of the Strategy	Major Findings	Strength of Evidence From Results	Reasons for Strength of Evidence
Program to improve organizational climate and culture Glisson et al., 2010 ¹⁴	Two-stage RCT, 596 youth, 257 therapists	Externalizing behaviors (youth referred to juvenile court with behavioral or psychiatric symptoms that require intervention) Ages 9–17 years	Program to improve organizational climate and culture vs. usual care	Educational meetings or materials Educational outreach visits Provider satisfaction initiative Audit and feedback	Details NR but does not demonstrate improvements in any measure of adherence by strategy group for any ARC vs. no ARC comparison Difference in out-of-home placements and child behavior problem scores at 18 months between ARC-only and usual-care groups did not meet statistical significance ($p=0.05$).	Low for no benefit for practitioner adherence Low for no benefit for patient change in mental health symptoms at 18 months	Medium study limitations, precise results Medium study limitations, precise results (small sample size), CIs likely overlap

Table C. Strategies to improve mental health of children and adolescents: Summary table (continued)

Strategy, Study	Designs, N	Target Condition and Ages of Youth	Comparisons	Component of the Strategy	Major Findings	Strength of Evidence From Results	Reasons for Strength of Evidence
Program to improve organizational climate and culture Glisson et al., 2012 ^{40,49}	Cluster RCT 352 caregivers of youth ages 5–18 in 18 programs	General mental health problems Ages 8–24 years	Program to improve organizational climate and culture vs. usual care	Educational meetings or materials Educational outreach visits Provider satisfaction initiative Audit and feedback	Trends toward improvement in all domains; nonoverlapping CI for some domains showing significant improvements ($p < 0.05$) for ARC group vs. usual care Lower problem behavior scores for youth in the ARC group compared with those in the control group during first 6 months of followup (following 18-month organizational implementation), effect size=0.29	Low for benefit for practitioner satisfaction Low for benefit for patient change in mental health symptoms	Medium study limitations, imprecise results (small study sample) Medium study limitations, imprecise results (small study sample)

Table C. Strategies to improve mental health of children and adolescents: Summary table (continued)

Strategy, Study	Designs, N	Target Condition and Ages of Youth	Comparisons	Component of the Strategy	Major Findings	Strength of Evidence From Results	Reasons for Strength of Evidence
Training nurses to educate parents about EBPs Gully et al., 2008 ⁴⁴	Interrupted time series in Study 1, 172 parents or caregivers; RCT in Study 2, 51 parents or caregivers	General mental health symptoms (children suspected of abuse during forensic medical examinations) Ages 2–17 years	Protocol to train nurses to educate parents about EBPs vs. typical services	Educational meetings or materials Educational outreach visits Patient-reported data	Strategy improved parent ratings of access to care (mean difference between groups ranged from 0.08 to 2.1 points in Study 1 and 0.6 to 1.9 in Study 2) (scale=1–5)	Low for benefit for patient access to care	High risk of bias, consistent, direct, precise results
					Improved parent ratings of satisfaction of care by a mean of 0.4 in Study 1 and 0.9 in Study 2 (scale=1–5)	Low for benefit for patient satisfaction	High risk of bias, consistent, direct, precise results
					Improved parent ratings of treatment engagement by a mean of 0.9 in Study 1 and 2.5 in Study 2 (scale=1–5)	Low for benefit for treatment engagement	High risk of bias, consistent, direct, precise results
					Improved parent ratings of therapeutic alliance by a mean of 0.4 in Study 1 and 0.9 in Study 2 (scale=1–5)	Low for benefit for therapeutic alliance	High risk of bias, consistent, direct, precise results

Table C. Strategies to improve mental health of children and adolescents: Summary table (continued)

Strategy, Study	Designs, N	Target Condition and Ages of Youth	Comparisons	Component of the Strategy	Major Findings	Strength of Evidence From Results	Reasons for Strength of Evidence
Adding intensive quality assurance to implement an EBP Henggeler et al., 2008 ⁴³	Controlled clinical trial, 30 practitioners, N of caregiver and patient reports and monthly data points NR	Substance use disorders (adolescents with marijuana abuse) Ages 12–17 years	Intensive Quality Assurance (IQA) system vs. workshop only to implement an EBP intervention	Quality monitoring	Study does not provide sufficient detail to judge magnitude of effect on practitioner adherence to cognitive behavioral therapy and monitoring techniques	Insufficient for practitioner adherence and fidelity	High study limitations, imprecise results
Adding computer-assisted training with or without ongoing supervision and coaching to practitioners implementing an EBP Henggeler et al., 2013 ⁴⁸	Cluster RCT; 161 therapists	Substance use disorders Ages 12–17 years	Workshop and resources (WSR) vs. WSR and computer-assisted training (WSR+CAT) to implement an EBP intervention	Educational meetings or materials	No statistically significant difference between groups for use, knowledge, and adherence	Insufficient for additional benefit of WSR+CAT vs. WSR comparison group for practitioner use, knowledge, and adherence	Medium study limitations, imprecise, small sample sizes, cannot determine whether CIs cross line of no difference
			WSR vs. WSR+CAT and supervisory support (WSR+CAT+SS) to implement an EBP intervention	Educational meetings or materials Educational outreach visits	No statistically significant difference between groups for use, knowledge, and adherence	Insufficient for additional benefit of WSR+CAT+S vs. WSR comparison group on practitioner use, knowledge, and adherence competence/skills	Medium study limitations, imprecise, small sample sizes, cannot determine if CIs cross line of no difference

Table C. Strategies to improve mental health of children and adolescents: Summary table (continued)

Strategy, Study	Designs, N	Target Condition and Ages of Youth	Comparisons	Component of the Strategy	Major Findings	Strength of Evidence From Results	Reasons for Strength of Evidence
Training practitioners to identify and refer cases Lester et al., 2009 ³⁷	Cluster RCT; 110 practices, 179 patients	Psychosis (adolescents and adults with first-episode psychosis) Ages 14–30 years	Professional training to identify and refer cases vs. usual care	Educational meetings or materials	Relative risk (RR) of referral to early intervention after first contact: 1.20, 95% CI, 0.74 to 1.95, p=0.48	Insufficient for patient access to care	High study limitations, imprecise results
				Educational outreach visits	No statistically significant differences between groups in changes in patient mental health status	Insufficient for patient change in mental health symptoms	High study limitations, imprecise results
					Patients in the professional training group averaged 223.8 fewer days for time from the first decision to seek care to the point of referral to an early intervention service than patients in the control group	Low for benefit for service utilization	High study limitations, imprecise results
					No adverse events were reported, no significant between-group differences for false-positive referral rates from primary care	Insufficient for patient harms	High study limitations, unknown precision

Table C. Strategies to improve mental health of children and adolescents: Summary table (continued)

Strategy, Study	Designs, N	Target Condition and Ages of Youth	Comparisons	Component of the Strategy	Major Findings	Strength of Evidence From Results	Reasons for Strength of Evidence
Training practitioners with or without feedback to implement an EBP Lochman et al., 2009 ⁴⁶	Cluster RCT, 511 patients	Externalizing behaviors (children at risk for aggressive behaviors) Ages: third-grade students	Professional training plus feedback (CP-TF) to implement an EBP intervention vs. control	Educational meetings or materials Audit and feedback	Students in CP-TF group had fewer behavioral problems as rated by teachers (beta=-0.41, SE=0.16, p=0.01) than controls but no significant difference in teacher ratings or parent ratings	Low for no benefit for changes in mental health status	Medium study limitations, precise results
					Students in CP-TF group had fewer minor assaults (e.g., hitting or threatening to hit a parent, school staff, or student) as reported by the child (beta=-0.25, SE=0.12, p=0.03) and social/academic competence as reported by the teacher (beta=0.35, SE=0.13, p=0.01) compared with controls	Low for benefit for change in socialization skills and behaviors	Medium study limitations, precise results

Table C. Strategies to improve mental health of children and adolescents: Summary table (continued)

Strategy, Study	Designs, N	Target Condition and Ages of Youth	Comparisons	Component of the Strategy	Major Findings	Strength of Evidence From Results	Reasons for Strength of Evidence
			Professional training only to implement an EBP intervention (CF-BT) vs. control	Educational meetings or materials	No significant difference in behavioral problems as rated by teachers or parents or student-reported assaults between CP-BT and control groups	Low for no benefit for changes in mental health status	Medium study limitations, precise results
					No significant differences in social/academic competence as reported by the teacher, nor were any significant differences found between groups on social skills as rated by parents.	Low for no benefit for change in socialization skills and behaviors	Medium study limitations, precise results

Table C. Strategies to improve mental health of children and adolescents: Summary table (continued)

Strategy, Study	Designs, N	Target Condition and Ages of Youth	Comparisons	Component of the Strategy	Major Findings	Strength of Evidence From Results	Reasons for Strength of Evidence
Training practitioners to use a patient medication monitoring program Ronsley et al., 2012 ³⁸	Interrupted time series Health care practitioners for 2,376 patients	Psychosis Ages <19 years (mean age = 11)	Patient medication monitoring training program for practitioners vs. usual care	Educational meetings or materials Educational outreach visits Reminders	38.3% of patients had a metabolic monitoring and documentation tool (MMT) in the charts after program implementation; drop in the prevalence of second-generation antipsychotic prescribing from 15.4% in the pre-metabolic monitoring training program (MMTP) period to 6.4% in the post-MMTP period (p<0.001) Increased metabolic monitoring over time (level of change varied by type of monitoring)	Low for benefit for practitioner adherence Low for benefit for patient service utilization	High study limitations, precise outcomes High study limitations, precise outcomes

Table C. Strategies to improve mental health of children and adolescents: Summary table (continued)

Strategy, Study	Designs, N	Target Condition and Ages of Youth	Comparisons	Component of the Strategy	Major Findings	Strength of Evidence From Results	Reasons for Strength of Evidence
Embedding a behavioral health care practitioner in primary care Sterling et al., 2015, ⁴⁷	Cluster RCT, 47 pediatricians with 1,871 eligible patients	Varied conditions among children attending a pediatric primary care office Ages 12–18	Pediatrician only vs. embedded behavioral health care practitioner (BHCP) implementation of an EBP	Multidisciplinary teams	No significant differences in substance use assessment between study arms (aOR, 0.93; 95% CI, 0.72 to 1.21); patients in the embedded BHCP group more likely than those in the pediatrician-only group to receive brief intervention (aOR=1.74, 95%CI, 1.31 to 2.31); patients in the BHCP group less likely to receive a referral to a specialist than patients in the primary-care- ^b only group (aOR=0.58, 95%CI, 0.43 to 0.78)	Low for no benefit for adherence (2 of 3 adherence outcomes were statistically significant)	Medium study limitations, unable to assess precision

Table C. Strategies to improve mental health of children and adolescents: Summary table (continued)

Strategy, Study	Designs, N	Target Condition and Ages of Youth	Comparisons	Component of the Strategy	Major Findings	Strength of Evidence From Results	Reasons for Strength of Evidence
Co-locating an EBP program in primary care	Controlled clinical trial, 4 pediatric practices, 20,917 children with primary care visit	Externalizing behavior problems Ages 2–12 years	Colocation of a behavioral health EBP parenting program in primary care vs. enhanced referral to a behavioral health EBP parenting program in a location external to the practice.	Changing the scope of benefits	OR for attending first EBP visit, 3.10; 95% CI, 1.63 to 5.89	Low for benefit for patient access to care	High study limitations, precise results
Wildman et al., 2009 ⁴¹					No improvement in mean number of sessions attended (calculated mean difference: -1.01; 95% CI, -2.60 to 0.58)	Insufficient for patient service utilization	High study limitations, precise results

^a Four study groups were examined: ARC+MST, ARC only, MST only, and usual care. Comparisons were ARC only vs. usual care or any ARC (combined ARC+MST and ARC only) vs. no ARC (combined MST and usual care), as noted.

^b Fewer referrals seen as improvement because this outcome indicates that the practitioner was able to give brief intervention without referral to behavioral health specialists.

ADHD = attention deficit hyperactivity disorder; aOR = adjusted odds ratio; ARC = Availability, Responsiveness and Continuity; CBT = cognitive behavioral therapy; CI = confidence interval; CP-TF = Coping Power training plus feedback; EBP = evidence-based practice; EHR = electronic health record; IAU = implementation as usual; IQA = Intensive Quality Assurance; MMT = metabolic monitoring program; MMTP = metabolic monitoring training program; MST = multisystemic therapy; N = number; NR = not reported; NS = not significant; OR = odds ratio; p = probability; RCT = randomized controlled trial; RR = relative risk; P4P = pay for performance; SE = standard error; WSR = workshop plus resources; WSR+CAT = workshop plus resources plus computer-assisted training; WSR+CAT+SS = workshop plus resources plus computer-assisted training plus supervisory support.

The strongest evidence in the review comes from a study of pay for performance. Therapists in the pay-for-performance group were more than twice as likely to demonstrate implementation competence as were the implementation-as-usual therapists (*moderate strength of evidence of benefit*).⁴² Other outcomes for which we found evidence of benefit (*low strength of evidence of benefit*) included:

1. Improved practitioner adherence to EBPs or guidelines from training practitioners to monitor metabolic markers,³⁸ providing computer decision support plus EHR that included diagnosis and treatment guidelines,³⁵ and offering an Internet portal for practitioner access to practice guidelines;⁴⁵
2. Improved practitioner morale, engagement, and stress from a program to improve organizational climate and culture;⁴⁰
3. Improved patient access to care, parent satisfaction, treatment engagement, and therapeutic alliance from training nurses to educate parents about EBPs;⁴⁴
4. Improved patient functional status from weekly feedback on patient symptoms and functioning to practitioners;¹³ and
5. Improved service utilization from training practitioners about monitoring medications³⁸ and appropriately identifying and referring patients.³⁷

Only four strategies (1 one study each) consistently provided *insufficient or evidence of no benefit* across all reported outcomes. These included:

1. A strategy testing augmented active learning versus computerized routine learning versus routine practitioner workshop to implement an EBP,³⁹
2. A collaborative consultation treatment service to promote the use of titration trials and periodic monitoring during medication management versus control,³⁶
3. An Intensive Quality Assurance system versus workshop to implement an EBP intervention,⁴³ and
4. Use of additional computerized assisted training or computerized training plus supervisory support to implement an EBP versus using a workshop and resources only.⁴⁸

The studies varied with respect to the numbers and types of active components; i.e., we observed considerable differences in components in treatment group strategies and comparison group strategies. In some studies, the treatment group contained several components and the comparison group contained none of those components. In other studies, both the treatment and comparison groups tested strategies with multiple components, with varying numbers of differences in components across arms. Because both arms often received active interventions, the Hawthorne effect may explain lack of effectiveness. We did not find any consistent patterns of effectiveness involving the number of active components. That is, we did not find that studies that employed strategies with a single active component had any better or any worse effect on outcomes than those that employed multiple active components.

Additional heterogeneity arose from several other sources and precluded any quantitative synthesis of our findings. Except for two studies reported in one publication⁴⁴ and two trials (three publications) reporting variants of a similar intervention,^{14,40,49} none of the other studies tested similar strategies. The outcomes of the studies varied widely. Similarly, settings differed greatly (community-based hospitals and clinics, general practice and primary care, home-based mental health systems, schools). Finally, the targets of each strategy, such as practitioners, practices, or systems, also differed considerably.

The absence of evidence on several factors of interest further limited our conclusions. We found no evidence of studies examining several intermediate outcomes, particularly system-level

intermediate outcomes. We also identified no studies that measured final patient health outcomes such as co-occurring conditions or mortality. We also found no evidence of strategies testing several components of the EPOC taxonomy, including any regulatory components, and little evidence on strategies with financial components.

Of the 17 studies in our review, one study had low risk of bias and three had medium risk of bias. We rated seven as having unclear risk of bias and six as having high risk of bias. Various issues with study design, attrition, and incomplete information reported by study authors precluded most of these studies from having a low or medium risk of bias.

The uncertain or high risk of bias of most of these studies affected the overall strength of evidence grades, as did the fact that we mainly had only single studies for each strategy examined.

Key Question 2. Harms Associated With Strategies to Improve Mental Health Care for Children and Adolescents

Only one study evaluated the harms associated with professional training to identify and refer cases to early-intervention services for untreated first-episode cases of psychosis.³⁷ The study reported no adverse events and no differences in false-positive referral rates. We graded the evidence on harms as having insufficient strength, based on high study limitations and imprecise results.

Key Question 3. Moderators of the Effectiveness of Strategies to Improve Mental Health Care for Children and Adolescents

Overall, we found evidence on four strategies that examined moderators of the effectiveness of strategies to improve mental health care for children and adolescents. Three examined whether training intensity influenced the degree of effectiveness; of these, two strategies were graded as having insufficient strength of evidence. The third strategy had low strength of evidence for benefit for patient intermediate outcomes (access to care) and patient health and service utilization outcomes (change in mental health status).

A fourth study examined the moderating effects of fidelity to the EBP (meeting target Adolescent Community Reinforcement Approach) used as part of the strategy. We graded the evidence on the moderating effect of fidelity on this strategy as having low strength for no benefit on patient health outcomes and patient remission status.

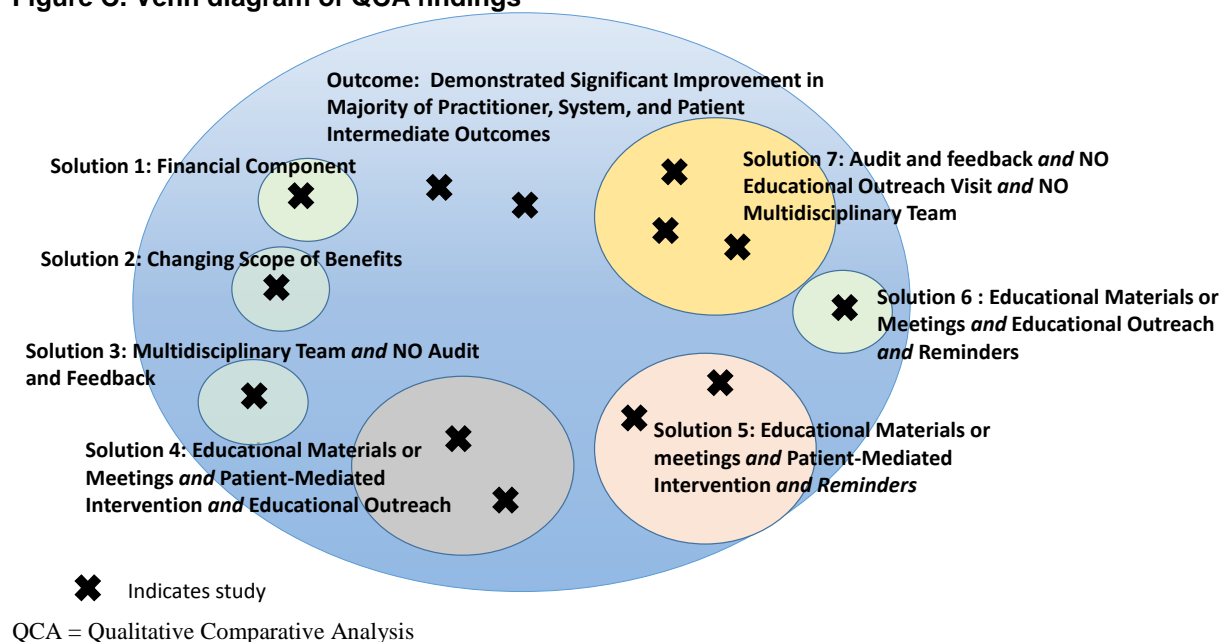
We did not find studies that examined most of our previously-specified list of moderators such as patient characteristics, intervention characteristics other than training intensity, factors of the outer or inner setting/organizational factors, characteristics of involved individuals, process characteristics other than fidelity to the training, or other moderators such as length of followup.

Finding Solutions for Success

We turned to QCA to understand what combinations of components (“condition sets”) might serve as solutions or “recipes” for success. We examined several different models that contained different combinations of intervention components resulting in two different outcomes. We chose the model that best fit our data with the highest level of consistency (proportion of solutions resulting in success or outcome) and coverage (proportion of observations explained by the solutions). Our model included the presence or absence of several professional components (educational materials or meetings, educational outreach, patient-

mediated interventions, audit and feedback), any financial component, organizational structural-oriented components (quality monitoring, change in scope and nature of benefits and services and patient choice of treatment), and organizational provider-oriented component (use of clinical multidisciplinary teams). We defined success as having a statistically significant improvement in either a majority of practitioner-, system-, and patient-level intermediate outcomes *or* at least one patient health or service utilization outcome showing at least low strength of evidence for benefit. The QCA yielded seven solutions associated with success, described below and shown in Figure C. Four of the solutions included only one study each. Two solutions included two studies each. And one solution included three studies. Two of the studies that showed benefit did not belong to any of the solutions yielded by the QCA. Of note, one study met criteria for two different solutions associated with success.

Figure C. Venn diagram of QCA findings



Our analysis included 17 studies; 12 showed significant improvements (i.e., significant improvement in majority of practitioner, system, or patient intermediate outcomes or at least one patient health or service utilization outcome showing at least low strength of evidence for benefit coded as 1). Five did not.

In the Boolean analysis of the truth table, no conditions were individually necessary or sufficient, and no necessary combinations occurred. Analysis of sufficient combinations for achieving significant improvements showed seven solutions, each with 100-percent consistency. Notably, the model had 83-percent coverage, accounting for 10 of the 12 studies that demonstrated at least low strength of evidence of benefit for at least one outcome. These solutions were:

- Having any financial component; *or*
- Having a component that included changing the scope or nature of benefits or services and patient choice of treatment; *or*
- Using clinical multidisciplinary teams and *not* having an audit and feedback component

- Having educational materials or meetings, patient-mediated interventions, and educational outreach; *or*
- Having educational materials or meetings, patient-mediated interventions, and reminders; *or*
- Having educational materials or meetings, educational outreach, and reminders; *or*
- Having an audit and feedback component and *not* having educational outreach and *not* using a clinical multidisciplinary team.

Discussion

Key Findings and Strength of Evidence

Overall, 12 of the 17 studies demonstrated effectiveness as measured by low or moderate strength of evidence for benefit for at least one outcome of interest. Our confidence in these results is limited by the paucity of studies on any strategy. We found moderate strength of evidence of benefit for pay for performance.⁴² We found low strength of evidence of benefit for at least one outcome among strategies that contained:

- reminders (i.e., a component that included patient- or encounter-specific information, provided verbally, on paper, or on a computer screen, that was designed or intended to prompt a health professional to recall information),^{35,38,45}
- a patient-mediated component (i.e., one that collected new clinical information directly from patients then given to the provider to review),^{35,44,45}
- enhanced referrals and patient choice of treatment.⁴¹

We found low strength of evidence of no benefit for intermediate outcomes for strategies that included the following combinations of professional components:

- educational materials and/or educational meeting components *only*^{39,48}
- educational materials and outreach components *only*.^{37,46}

We were unable to judge the potential for harms associated with these strategies that may mitigate benefits based on the single included study on early intervention for first-episode psychosis that reported no adverse events and no differences in false-positive referral rates. In addition, the available evidence from four studies on two moderators does not permit us to make general conclusions about the conditions under which these strategies might work optimally.

Applicability

The applicability of findings is limited to professionally trained practitioners of children and adolescents with mental health and/or substance use disorders who delivered QI, implementation, and dissemination strategies in typical service settings. All strategies reviewed were focused at the practitioner (e.g., training practitioners) or system (e.g., implementing a new medical management system) level. Comparison conditions included usual treatment, lower-intensity versions of the strategy under study, and prestrategy implementation cases in one study implementing a system-level strategy within a hospital.

Outcomes examined in the studies included intermediate practitioner, intermediate patient, and a single intermediate system outcomes (uptake). No studies examined other intermediate system outcomes such as feasibility, timeliness, penetration, sustainability, and resources, including costs. Several patient health outcomes of interest such as comorbidity and mortality

were not examined in any included studies. Thus, applicability of findings is limited to these outcomes examined.

Limitations of the Systematic Review Process

Challenges in this systematic review arose from the sparse amount of prior literature on this topic that limited defining many of the details of our review a priori. Specifically, we struggled with defining the intervention of interest, constructing the search strategy, and applying prespecified inclusion/exclusion criteria. The lack of consistency in the terminology used in the published literature meant that the use of self-selected descriptors such as “QI,” “implementation,” or “dissemination” by study authors did not conform to our a priori definitions of these types of studies or to the other similarly labeled studies in the field; this lack of consistency led to our reliance on the EPOC taxonomy as our primary analytic framework. Regarding searches, we ran multiple iterations over a period of 7 months. We initially mirrored the search strategy in a previously published review but had to make substantial changes to capture concepts or terms that were not indexed by the National Library of Medicine’s MeSH.

We found that attempts to specify the population and comparison criteria to ensure greater homogeneity of included interventions resulted in additional challenges. For example, our focus on children and adolescents with *existing* mental health issues (rather than the *risk of* mental health issues only) did not enable focus on prevention. In addition, although we included a broad range of eligible comparators in our protocol (usual care, or any other QI, implementation, or dissemination strategy), we did encounter otherwise eligible studies in which the intervention combined both a patient-level intervention and a system-level strategy to implement or disseminate that intervention. Because the use of a usual-care arm did not permit the authors to draw conclusions about the effect of the implementation or dissemination strategy apart from the underlying intervention, we excluded these studies for having a wrong comparator.⁵⁰⁻⁵⁷

Limitations of the Evidence Base

We found relatively few studies that examined the effectiveness of strategies to improve the mental health care of children and adolescents. Although we did find evidence that some strategies are effective in improving both intermediate and patient health and resource utilization outcomes, we found only one study that focused on system-level intermediate outcomes and none that compared the costs of these strategies.

The lack of a common language to describe even a basic concern such as the primary purpose of the strategies (QI, implementation, or dissemination) served as a hindrance to synthesis. Strategies varied significantly in the number of components; the reporting on these components was not always clear enough to adequately describe the strategy or fully understand the relative importance of component parts. Studies often offered limited descriptions of “usual-care” arms when compared with descriptions of experimental arms. Even with limited reporting, we found wide differences in the number, intensity, and services offered in “usual-care” arms. These differences sharply limited our ability to make statements about the overall effectiveness of these strategies as a class.

Only one study examined harms. Although the field generally acknowledges the vast array of potentially influential moderators in implementation research,⁵⁸ we uncovered only four studies on two moderators (intensity and fidelity). The paucity of evidence on these issues further limits our understanding of the minimum change in strategy needed to achieve a significantly different process or health outcome.

We rated most outcomes as insufficient or low strength of evidence because of the underlying heterogeneity or limited number of studies on specific strategy types, system or practitioner targets, or child or adolescent conditions. In some instances, our grades were limited by high risk of bias in included.

Our ability to derive firm conclusions on the effectiveness of included strategies was also hindered by reporting issues in the literature. Authors reported complex analyses but often did not report other issues well enough to permit an independent evaluation of the effect size,⁴⁶ precision of the effect,^{35-37,40} or risk of bias.^{35,46}

Research Recommendations

The evidence base is marked by a small number of studies on diverse strategies and outcomes focusing on intermediate and health outcomes and resource use; we had very few studies on harms or moderators. Our review highlights the fact that the current state of the evidence does not give clinicians and health plan administrators a definitive understanding of best methods to introduce EBPs successfully into clinical settings. Third-party payers are paying increasing attention to quality metrics, as health care systems move to accountable care models. We found no studies on regulatory components and just one study testing the effectiveness of a financial component, specifically for pay for performance.⁴⁵ Future research efforts should evaluate variations of such programs according to patient, provider, organization, systems, and setting characteristics. A better understanding of these variables can impede or promote the implementation and dissemination of EBPs.

We did not find evidence on the majority of the outcomes that we specified a priori. Of particular note, seven strategies (two from a single publication) relied on EBPs; for that reason, these investigators did not report patient health outcomes.^{39,43-45,47,48} When researchers maintain fidelity to the original intervention, the assumption that the same level of effectiveness will occur in a new trial is reasonable and leads to an efficient use of research funds. Unfortunately, not all studies measured fidelity adequately. New strategies relying on EBPs must, at a minimum, report on fidelity so practitioners and policymakers can judge whether the strategy is, in fact, new intervention, rather than implementation or dissemination of an existing intervention. Information on pragmatic issues related to implementation (fidelity, adaptation, and minimum elements necessary to achieve change) may not necessarily require new studies on strategies with existing information; support of analyses done with data from existing studies may fill some of the gap.

The majority of included studies appropriately used cluster RCTs. Cluster RCTs, like pragmatic trials, need more resources than conventional RCTs and are harder to complete than conventional studies. An additional consideration of cluster RCTs relates to reporting. The studies we found were marked by poor reporting or failure to report key details of the strategy or differences across study arms. Concerns about the inadequacies of reporting have been noted elsewhere in the literature.^{59,60} A recent tool, the StaRI, (standards for reporting implementation studies of complex interventions), offers standards for reporting implementation studies that, if adopted widely, can significantly improve the utility of these studies and the pace of translation of evidence into practice.⁶¹

Although the failure to use EBPs results can lead to gaps between potential and achieved outcomes, closing such gaps requires more than just using an array of EBPs. What continues to be unknown is how to bridge the gap in the context of the finite resource of time allocated for a patient encounter. As expectations for documenting or checking off quality metrics for each

action within a patient encounter increase, the risk of errors of omission or commission increases. For new information to be actionable, more evidence is needed on the relative merits of each action or strategy.

More research is needed on strategies for the QI, implementation, and dissemination of EBPs in psychotherapy treatments as well as medication treatments of mental illness in youth. Other important targets include the development of dissemination strategies for introducing mental health care into areas lacking in mental health care, for example, very rural areas with fewer mental health providers. In these areas especially, targeting primary care providers may be essential.

Conclusions

Our findings suggest that several approaches can improve both intermediate and final health outcomes and resource use. Twelve of the 17 included studies (11 of the 16 strategies) significantly improved at least one such outcome or measure. Moderate strength of evidence (from one RCT) supported using provider financial incentives such as pay-for-performance to improve the competence with which practitioners can implement EBPs. We found inconsistent evidence involving strategies with educational meetings, materials, and outreach; programs appeared to be successful in combination with reminders or providing practitioners with newly collected clinical information. We also found low strength of evidence for *no* benefit for initiatives that included only educational materials or meetings (or both), or only educational materials and outreach components.

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Introduction

Background

Condition

Approximately one in five children and adolescents living in the United States has one or more mental, emotional, or behavioral health disorders according to the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* criteria in any given year.¹ These disorders contribute to problems with family, peers, and academic functioning. They may exacerbate coexisting conditions (including other mental and substance use disorders and chronic health conditions) and may reduce quality of life. They also increase the risk of involvement with the criminal justice system and other risk-taking behaviors and suicide.²

Strategies To Improve Mental Health in Children

Several key publications in the mid- to late-1990s suggested that usual care in children's mental health had, at best, no³ and sometimes harmful effects.⁴ Since then, mental health interventions that improve children and adolescents with mood disorders, anxiety disorders, disruptive behavior disorders, psychotic disorders, eating disorders, and substance use disorders have been tested to varying degrees of benefit.^{5,6}

Despite advances in the evidence base,^{5,7} some outcomes for children with mental health problems remain suboptimal because of issues with access to care and the failure of systems and providers to adopt established quality improvement (QI) strategies and interventions with proven effectiveness (e.g., evidence-based practices [EBPs]). Studies using nationally representative data on U.S. adolescents show that only approximately one in five children with mental health problems receives services, and only one-third of treatment episodes are considered minimally adequate (at least four visits with psychotropic medication or at least eight visits without psychotropic medication).⁸⁻¹⁰ The current health care system continues to provide fragmented care to children and adolescents in numerous uncoordinated systems, rendering inefficient the delivery of needed services.¹¹ Moreover, clinicians (particularly primary care practitioners) may lack the time, knowledge, or training to identify and treat or refer patients with mental health problems.¹²

Given the gap between observed and achievable processes and outcomes, one way to improve the mental health care of children and adolescents is to adopt QI strategies and develop strategies to implement or disseminate interventions with known effectiveness. Such strategies target changes in the organization and delivery of mental health services.^{13,14} They seek to improve the quality of care and patient outcomes by closing the gap between research evidence and practice.¹⁵⁻¹⁷

In keeping with recent Agency for Healthcare Research and Quality (AHRQ) reviews with a similar focus,¹⁸ we view QI strategies as “any intervention aimed at reducing the quality gap for a group of patients representative of those encountered in routine practice.”^{16, p.13} For this review, we focus on QI strategies targeting practitioners (e.g., via education, training, and supervision) and organizations (e.g., via financial incentives, regulation, and policies) that provide mental health care to children and adolescents, with the ultimate goal of improving both the process and outcomes of that care.^{19,20}

Some investigators consider implementation and dissemination strategies as a particular subset of initiatives to improve the quality of care. However, the field of implementation and dissemination is so new that the conceptual framework and terminology in relationship to QI efforts have not been fully standardized yet.²¹ We do not take a position on the taxonomy of these terms but refer in the remainder of this report to these strategies as QI, implementation, and dissemination.

Implementation strategies can be differentiated from dissemination strategies.²²⁻²⁵ Implementation is “the use of strategies to integrate evidence-based health interventions (e.g., EBPs) and change practice patterns within specific settings.”^{22, p.2} Dissemination is “the active and targeted distribution of information and interventions to a specific public health or clinical practice audience via determined channels using planned strategies,” with “the intent to spread knowledge and associated evidence-based interventions to enhance the adoption and the implementation of the information or intervention.”^{22, p.2}

The taxonomy used by the international Cochrane Review Group’s Effective Practice and Organisation of Care (EPOC) Group, which studies complex strategies designed to improve health care professionals’ practice and the organization of health care services, classifies these strategies by whether they include one or more professional, financial, organizational, and regulatory components. Strategies that ultimately strive to improve practice and organization of services typically include various forms of continuing education for providers; quality assurance projects; and financial, organizational, or regulatory interventions that can enable health care professionals to deliver services more effectively and efficiently.

The ultimate goal of these strategies is to improve patient health and service utilization outcomes for children and adolescents with mental health problems. Intermediate outcomes in this context include changes to health care systems, organizations, and practitioners that provide mental health care. Targeting multiple, interrelated, nested levels such as the macro environment (e.g., state), organization or system (e.g., specialty mental health clinic), program (e.g., selected intervention), practitioners (e.g., clinicians), and patients (e.g., children or adolescents and their families) typically increases the effectiveness and sustainability of a particular strategy.^{26,27} For instance, changes in intermediate outcomes such as practitioners’ attitudes²⁸ or organizational climate²⁹ may influence the successful adoption of and fidelity to EBPs. These practices in turn influence patient health outcomes, such as behavior or quality of life.

Potential Moderators of Strategy Effectiveness

Several frameworks guide investigations of how certain variables, including contextual factors, influence the effectiveness of the QI, implementation, or dissemination strategy.³⁰⁻³⁴ For example, factors such as the diversity of outpatient settings, which may include schools, primary care, specialty mental health, emergency rooms, and, increasingly, homes for children’s mental health services, may influence the generalizability and applicability of QI, implementation, or dissemination efforts. The organizational factors of the clinical setting may influence outcomes, and many have argued that these unique factors should be examined within the context of QI, implementation, and dissemination studies.^{35,36}

One framework commonly used to study implementation research, the Consolidated Framework for Implementation Research (CFIR),³² comprises five major domains:

1. intervention characteristics (e.g., strength of the evidence base behind the intervention);
2. “inner setting” (e.g., culture, leadership, and engagement of health care organizations);
3. “outer setting” (e.g., patient needs and resources, external policies and incentives);

4. characteristics of involved individuals (e.g., professional training, experience or characteristics of parents/caregivers); and
5. process by which implementation is accomplished (e.g., plan, evaluate, and reflect).

This CFIR framework can be applied to research on effective implementation of mental health strategies for children and adolescents to begin to understand salient contextual factors.³⁷ We used the CFIR as an organizing framework for moderators of strategy effectiveness. In addition to the five domains of the CFIR described above, we added another category of moderators, namely, characteristics of the patient.

Scope and Key Questions

Rationale for Evidence Review

The increasing interest in strategies to improve professional practice and delivery of effective mental health services for children and adolescents with mental health problems indicates that the existing body of evidence on these strategies stands poised for an objective systematic review. Decisionmakers are in critical need of information about these approaches to improve children's mental health care. A better understanding of the comparative benefits, harms, and modifiers of the available strategies to achieve these improvements may help guide a wide array of interests, particularly for practitioners and administrators of care facilities, organizations, and health systems. Such information will also prove important for those making insurance coverage and other policy decisions for these patients with mental health care needs.

This review focuses on evidence about strategies that aim to improve the quality of mental health care rather than evidence about the efficacy or effectiveness of specific interventions. We concentrate on efforts that target practitioners or organizations/systems that care for children and adolescents with mental health problems.

Proposed Contributions to the Evidence Base

Two recent systematic reviews have addressed this topic. In 2012, Barwick and colleagues examined knowledge translation interventions and strategies related to the delivery, organization, or receipt of child and youth mental health services.³⁸ Most studies focused on practitioner or teacher training for behavior change. This systematic review excluded studies of children with substance abuse. In 2013, Novins and colleagues focused on the implementation and dissemination of mental health EBPs, including substance abuse, for children and adolescents.³⁹ Our review updates the evidence while considering a broader definition of QI, implementation, and dissemination strategies and a wider array of mental health care needs of children and adolescents than studied in prior reviews.

Scope of the Review

As reflected in our Key Questions (KQs) and analytic framework below, we have three primary aims for this review. First, we will increase knowledge about the effectiveness of QI, implementation, and dissemination strategies that seek to improve the mental health care of children and adolescents. Second, we will examine harms associated with these strategies. Third, we will attempt to determine whether effectiveness or harms vary in subgroups based on system, organizational, practitioner, or patient characteristics.

Based on feedback from our Key Informants, we did not attempt to review studies that focused on strategies that target systems, organizations, or providers who treat children and adolescents who have only developmental disorders, because of heterogeneity in strategies used and types of systems involved in their care.

Ultimately, this review will inform mental health clinicians, health care system and organization administrators, policymakers, and researchers about effective ways to improve care for children and adolescents with mental health problems.

Key Questions

KQ 1: What is the effectiveness of QI, implementation, and dissemination strategies employed in outpatient settings by health care practitioners, organizations, or systems that care for children and adolescents with mental health problems to improve:

- a. intermediate patient, provider, or system outcomes
- b. patient health and service utilization outcomes?^a

KQ 2: What are the harms of these mental health strategies?

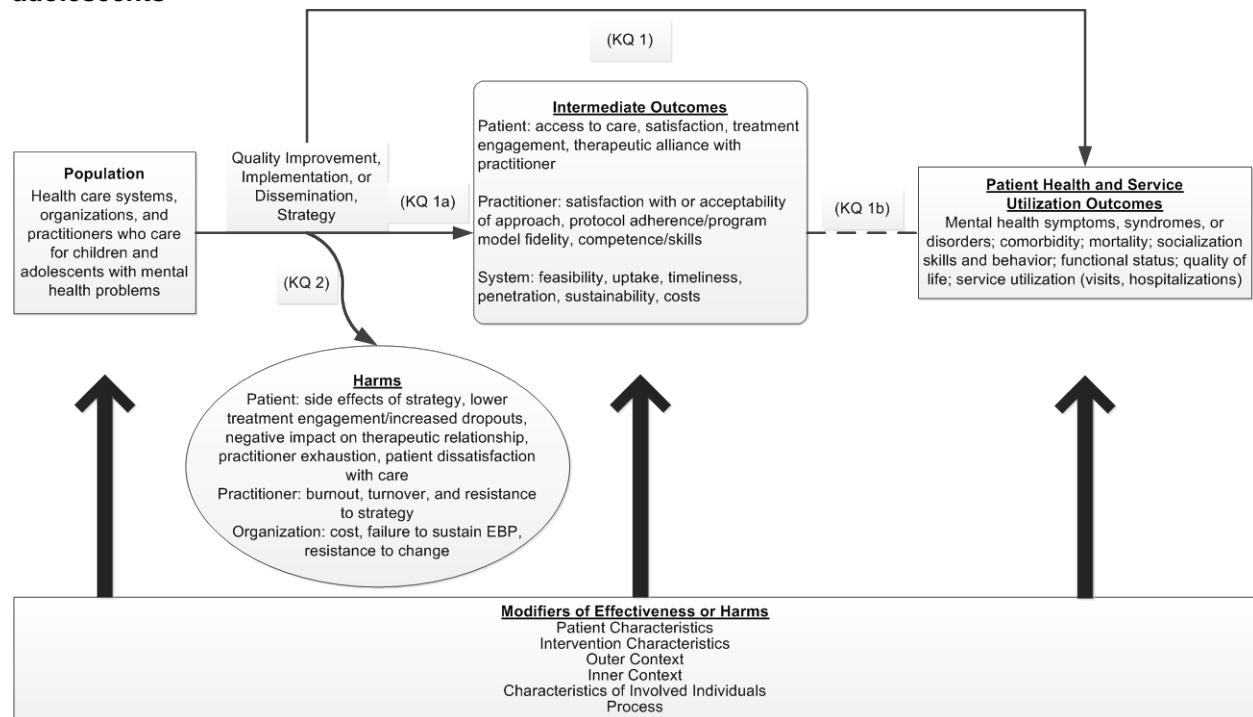
KQ 3: Do characteristics of the child or adolescent or contextual factors (e.g., characteristics of patients, practitioners, organizations, or systems; intervention characteristics; setting; or process) modify the effectiveness or harms of strategies to improve mental health care and, if so, how?

Analytic Framework

Figure 1 depicts the patient populations, interventions, comparators, outcomes, and timing of outcomes assessment (PICOTs) and KQs in relation to these PICOTs.

^a We revised KQ 1 and the outcome specified in our protocol slightly for clarity. We replaced the term “health care providers” with “health care practitioners” to indicate that this particular phrase refers to individuals rather than systems or institutions. We also replaced “final outcomes” with “patient health and service utilization outcomes” for clarity.

Figure 1. Analytic framework for strategies to improve mental health care in children and adolescents



EBP = evidence-based practices; KQ = Key Question.

Organization of This Report

We describe our methods, and we present our key findings in Results. In Discussion, we discuss our findings; we also examine the limitations of the evidence base and this review, clarify gaps in the knowledge base, and offer recommendations for future research. References follow the final section.

The main report has several appendixes, as follows: A, search strategies; B, EPOC taxonomy tables; C, excluded studies; D, risk of bias tables; E, forest plots; F, strength of evidence; G, transparency of reporting; and H, qualitative comparative analysis. Evidence tables can be accessed at <http://srdhr.ahrq.gov/projects/530>.

Methods

The methods for this systematic review follow the *Methods Guide for Effectiveness and Comparative Effectiveness Reviews* from the Agency for Healthcare Research and Quality (AHRQ; available at <http://www.effectivehealthcare.ahrq.gov/methodsguide.cfm>). The PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) checklist facilitated the preparation and reporting of the systematic review.⁴⁰

Topic Refinement and Protocol Review

The Evidence-based Practice Centers (EPCs) developed this topic and Key Questions (KQs) through a public process. The topic was nominated within AHRQ and subsequently developed and refined by our EPC. Initially, a panel of Key Informants gave input on the KQs to be examined; AHRQ then posted these questions on the Effective Health Care Web site for public comment from September 15, 2014, through October 6, 2014. We revised the KQs in response to comments.

We then drafted a protocol for the systematic review and recruited a panel of technical experts to provide high-level content and methodological expertise throughout the development of the review. The final protocol was posted on the Effective Health Care Web site at <http://effectivehealthcare.ahrq.gov/search-for-guides-reviews-and-reports/?pageaction=displayproduct&productid=2030> on December 30, 2014, and registered on PROSPERO (Registration number: CRD42015024759). Following release of our draft report and peer review, we amended our protocol to include additional review and analysis strategies suitable for complex interventions.

Literature Search Strategy

Search Strategy

We systematically searched, reviewed, and analyzed the scientific evidence for each of our three KQs. We began with a focused MEDLINE® search for eligible interventions using a combination of medical subject headings (MeSH®) and title and abstract keywords, limiting the search to human-only studies (Appendix A) (from inception through January 14, 2016). We also searched the Cochrane Library, PsycINFO, and CINAHL (Cumulative Index to Nursing and Allied Health Literature) using analogous search terms. These searches included randomized controlled trials (RCTs), controlled clinical trials (CCTs), and systematic reviews. We selected these databases based on preliminary searches and consultation with content experts. We conducted quality checks to ensure that the search identified known studies (e.g., studies identified during topic nomination and refinement). If we did not identify the known studies, we revised and reran our searches.

In addition, we searched the gray literature (information that is unpublished and not controlled commercially) for studies relevant to this review and included studies that met all the inclusion criteria and contain enough methodological information to assess risk of bias. Sources of gray literature include ClinicalTrials.gov, the World Health Organization's International Clinical Trials Registry Platform, the National Institutes of Health Research Portfolio Online Reporting Tools, the Database of Promoting Health Effectiveness Reviews, and CMS.gov. To avoid retrieval bias, we manually searched the reference lists of landmark studies and

background articles on this topic to look for any relevant citations that our electronic searches might have missed.

Inclusion and Exclusion Criteria

We specified our inclusion and exclusion criteria based on the populations, interventions, comparators, outcomes, timing, and settings (PICOTS) identified through the topic refinement exercise (Table 1).

Table 1. Inclusion/exclusion criteria for strategies to improve mental health services for children and adolescents

Category	Inclusion	Exclusion
Population	Health care systems, organizations, and practitioners that care for children and adolescents or mixed (child and adult) populations with mental health problems	Health care systems, organizations, and practitioners that care only for adults 18 years of age or older Health care systems, organizations, and practitioners that care for children and adolescents with only developmental disorders
Interventions (Strategies)	<ul style="list-style-type: none"> • Quality improvement strategies (e.g., strategies targeting systems and practitioners of mental health care to children and adolescents with the goal of improved quality of care) • Implementation strategies (e.g., strategies to integrate evidence-based practice [EBP] interventions that meet National Registry of Evidence-based Programs and Practices [NREPP] inclusion criteria with the goal of changing practice patterns) • Dissemination strategies (e.g., strategies to enhance the adoption and implementation of evidence-based interventions that meet NREPP inclusion criteria) 	Interventions targeting only patients, only drug interventions (although strategies to implement or disseminate drug interventions would qualify), and interventions not otherwise described in inclusion criteria
Comparator	Any control strategy, including usual care or different variants of the same intervention	None
Outcomes	<p>Intermediate outcomes (at least one intermediate outcome is required for KQs 1, 3)</p> <p>Patient</p> <ul style="list-style-type: none"> • access to care • satisfaction • treatment engagement • therapeutic alliance with practitioner <p>Practitioner</p> <ul style="list-style-type: none"> • satisfaction with or acceptability of approach • protocol adherence/program model fidelity • competence or skills <p>System or organization</p> <ul style="list-style-type: none"> • feasibility • uptake • timeliness • penetration • sustainability • resources (including costs) 	All outcomes not otherwise specified

Table 1. Inclusion/exclusion criteria for strategies to improve mental health services for children and adolescents (continued)

Category	Inclusion	Exclusion
Outcomes (continued)	<p>Patient health and service utilization outcomes (at least one of these outcomes is required for KQs 1 and 3 unless the strategy uses an intervention that is an EBP)</p> <ul style="list-style-type: none"> • Change in mental health status, including symptom change, response, remission, relapse, and recurrence • Coexisting physical health conditions, substance use problems, developmental disorders, other mental health problems <p>Mortality Socialization skills and behavior Functional status Quality of life Service utilization (e.g., visits, hospitalizations) Harms of strategy</p> <p>Patient</p> <ul style="list-style-type: none"> • lower treatment engagement or more dropouts • negative impact on therapeutic relationship • side effects of EBP incorporated into strategy (e.g., adverse events, suicidality) • patient dissatisfaction with care <p>Practitioner</p> <ul style="list-style-type: none"> • burnout or exhaustion • turnover • resistance to the intervention <p>System or organization</p> <ul style="list-style-type: none"> • cost • failure to sustain the EBP • resistance to change 	
Timing of outcome measurement	All	None
Settings	Outpatient settings serving children and adolescents with mental health problems (primary care, specialty care, emergency rooms, community mental health centers, integrated care settings, federally qualified health centers, schools, homes)	Inpatient or residential treatment settings, drug treatment programs, jails or prisons
Geographic setting	Countries with a very high Human Development Index (HDI) ⁴¹	Countries with high, medium, low, or very low HDI
Publication language	English	All other languages

Table 1. Inclusion/exclusion criteria for strategies to improve mental health services for children and adolescents (continued)

Category	Inclusion	Exclusion
Study design	KQs 1, 3 (benefits) <ul style="list-style-type: none"> • RCTs • CCTs • Systematic review and meta-analyses • Cohort studies • Interrupted time series • Case-control studies KQs 2, 3 (harms): <ul style="list-style-type: none"> • RCTs • CCTs • Systematic review and meta-analyses • Cohort studies • Interrupted time series • Case-control studies 	Case series Case reports Nonsystematic reviews Cross-sectional studies Before and after studies without time-series data Other designs without a control or comparison group
Publication type	Any publication reporting primary data	Publications not reporting primary data

CCT = controlled clinical trial; EBP = evidence-based practice; D = dissemination; HDI = Human Development Index; I = implementation; KQ = Key Question; NREPP = National Registry of Evidence-based Programs and Practices; QI = quality improvement; RCT = randomized controlled trial.

We included quality improvement (QI), implementation, and dissemination strategies that targeted systems, organizations, or practitioners of mental health care to children and adolescents ages 18 years or younger, who were already experiencing mental health symptoms. We did not include strategies such as the implementation of educational interventions for reading disorders. We also limited our review of implementation strategies to those focusing on evidence-based practice (EBP) interventions. For defining EBPs, we relied on the minimum requirements set forth by the Substance Abuse and Mental Health Services Administration's (SAMHSA's) National Registry of Evidence-based Programs and Practices (NREPP) (www.nrepp.samhsa.gov). These criteria specify that the intervention needs to have produced one or more positive behavioral outcomes in at least one study using an experimental or quasi-experimental design with results published in a peer-reviewed journal or similar publication. In addition, implementation materials, training and support resources, and quality assurance procedures for these interventions need to be ready for use by the public. Because we view the NREPP criteria as a liberal definition of "evidence," we do not anticipate missing studies with a basic level of proven effectiveness.

We use the term "strategy" to reference the total sum of components used to target health care systems and/or practitioners to improve the quality of care for children and adolescents with mental health problems. We use the term "intervention" to denote a specific EBP used as part of a strategy. Examples of types of included strategies are outlined below.

1. QI: strategies targeting systems and providers of mental health care to children and adolescents with the goal of improved quality of care. Examples of QI strategies include the following:^{16,18}
 - a. Organization or system targets: changes to the organization including case management, changing from paper to computer systems, increased staffing, changes in reimbursement schemes
 - b. Clinician targets: audit and feedback, facilitated relay of clinical data to providers, pay for performance, and provider reminder systems

2. Implementation: strategies used to adopt and integrate EBPs (defined based on the minimum criteria set forth by SAMHSA's NREPP) into routine care (e.g., strategies to integrate evidence-based health interventions and change practice patterns). Examples of implementation strategies that vary by method of implementation facilitation include the following:
 - a. Planning
 - b. Educating
 - c. Financing
 - d. Restructuring
 - e. Managing quality
 - f. Attending to policy contexts⁴²
3. Dissemination: strategies used to disseminate evidence through increasing access to EBPs, people's motivation to use and apply EBPs (defined based on the minimum criteria set forth by SAMHSA's NREPP), or people's ability to use and apply EBPs. Examples of such approaches include the following:
 - a. Increasing the reach of the evidence (e.g., social media, interpersonal outreach)
 - b. Increasing people's motivation to use and apply the evidence (e.g., use of opinion leaders, champions, social networks)
 - c. Increasing people's ability to use and apply the evidence (e.g., additional resources, skills building)
 - d. Using a multipronged approach with any of these three dissemination strategies (e.g., social marketing, academic detailing)²²

Because strategies tended to be complex in nature and the number and types of components that varied between the treatment arm and comparison group arm differed by study, we also recorded components of each strategy by study arm according to the Effective Practice and Organisation of Care (EPOC) taxonomy (Appendix B).⁴³ Because many of the comparison groups also contained several components, we marked the components contained in each study arm. This allowed us to fully describe the numerous components that were being combined and tested in each strategy, as well as enabled us to determine whether the study arms differed by a single or multiple components.

We required each included study to report at least one intermediate outcome in a minimum of one of three major categories: (1) practitioner intermediate outcomes (satisfaction, adherence, fidelity, competence), (2) system intermediate outcomes (feasibility, uptake, timeliness, penetration, sustainability, costs), and (3) patient intermediate outcomes (access to care, satisfaction, engagement, therapeutic alliance). This requirement helped ensure that each included study demonstrated impact based on its stated goals of improving quality or implementing or disseminating evidence-based interventions. We also required each study to report at least one patient health or service utilization outcome (change in mental health status, comorbid conditions, mortality, socialization skills and behavior, functional status, quality of life, service utilization) if the strategy was not implementing or disseminating an EBP intervention (i.e., an intervention with proven effectiveness).

For all KQs, we excluded study designs without comparison groups to ensure that our pool of included studies provided strong evidence on the causal link between the strategy and outcomes. We also required that the comparator enabled examination of the strategy effectiveness. That is, we excluded studies in which the strategy (system, organizational, practitioner targets) and the intervention being tested both differed between groups, because the effectiveness of the QI,

implementation, or dissemination strategy could not be isolated from the baseline intervention effects.

For KQ 1 studies of benefits and KQ 3 studies of moderators of benefits, we had planned to limit our evidence base to RCTs (standard, clustered, stepped-wedge), CCTs (not randomized), systematic reviews, or meta-analyses. We also planned to consider other designs—specifically, cohort studies (prospective, retrospective, and historical control), interrupted time-series, and case-control studies that met all other inclusion and exclusion criteria—if we found sparse evidence to answer these KQs using trials and systematic reviews (with or without meta-analyses). For KQ 2 and KQ 3 studies of moderators of harms, we included experimental studies noted above, interrupted time series, and observational evidence from prospective cohort studies, retrospective cohort studies, and case-control studies that met all other inclusion and exclusion criteria.

Our exclusion of non-English-language studies is based on limitations of time and resources. However, we examined English-language abstracts of non-English-language studies to assess the potential size of the literature that would be missed through this approach.

Moderators

We searched for studies with information on the following seven moderators of effectiveness or harms. Categories 2 through 6 are consistent with the Consolidated Framework for Implementation Research framework defined earlier.

1. Patient characteristics, such as age, gender, race and ethnicity, cognitive ability, diagnosis and severity of mental health problem, coexisting conditions, and cotreatments;
2. Intervention characteristics, such as complexity; manualized or not; intensity, frequency or duration; and adjustment of intervention to fit context;
3. Outer setting, such as external policy, incentives, availability of alternative care systems;
4. Inner setting or organizational factors, such as type of outpatient setting, structure or size, culture, implementation climate, and readiness of organization for implementation;
5. Characteristics of involved individuals such as type, knowledge, beliefs, self-efficacy, leadership, education, certifications, and years of practice of practitioners or characteristics of parents/caregivers;
6. Process characteristics, such as fidelity to the planned strategy, fidelity to the EBP, use of champions, and supervision or oversight; and
7. Other components, such as length of followup.

Study Selection

Two trained research team members independently reviewed all titles and abstracts identified through searches for eligibility against our inclusion and exclusion criteria. Studies marked for possible inclusion by either reviewer underwent a dual, independent full-text review. For studies without adequate information to determine inclusion or exclusion, we retrieved the full text and then made the determination. We tracked all results in an EndNote® bibliographic database (Thomson Reuters, New York, NY).

We retrieved and reviewed the full text of all articles included during the title and abstract review phase. Two trained team members independently reviewed each full-text article for inclusion or exclusion based on the eligibility criteria described above. If both reviewers agreed that a study did not meet the eligibility criteria, we excluded the study. If the reviewers disagreed, conflicts were resolved by discussion and consensus or by consulting a third member

of the review team. All results were tracked in an EndNote database. We also recorded the main reason that each excluded full-text publication did not satisfy the eligibility criteria (Appendix C).

Data Extraction

For studies that met our inclusion criteria, trained reviewers abstracted important information into evidence tables. We designed data abstraction forms (in AHRQ's Systematic Review Data Repository) to gather pertinent information from each article. Data recorded included the strategies (including evidence-based interventions), characteristics of the target(s) of the specific strategy (such as systems, organizations, and clinicians), comparators, settings, characteristics of the children or adolescents with mental health problems, study designs, analysis methods, and results. A second member of the team reviewed all data abstractions for completeness and accuracy.

For systematic reviews with or without meta-analyses, we planned to use the five-step process described in the *AHRQ Methods Guide*⁴⁴ to assess the relevance and quality of the systematic review and to determine how to use the information provided. We intended then to either incorporate existing systematic reviews into this one or use them to replace all or part of the de novo process or refine our search strategy only if they were fully relevant and of high quality. Reviews that did not meet these criteria would be used to cross-check references.

Risk of Bias Assessment

To assess the risk of bias of studies, two independent reviewers used predefined, design-specific criteria based on guidance in the *Methods Guide* (Appendix D).⁴⁵ We resolved conflicts by consensus or by consulting a third member of the team. For RCTs, we relied on the risk of bias tool developed by the Cochrane Collaboration.⁴⁶ We assessed the risk of bias of observational studies using questions from an item bank developed by RTI International⁴⁷ and A Cochrane Risk Of Bias Assessment Tool for Non-Randomized Studies of Interventions (ACROBAT-NRSI).⁴⁸ Minimum eligibility criteria for systematic reviews included an explicit description of search strategy used and determination that the search strategy was adequate, application of predefined eligibility criteria and risk of bias assessment for all included studies, and synthesis of the results presented.

In general terms, a study with no identifiable flaws has a low risk of bias. A study with medium risk of bias is susceptible to some bias but probably not sufficient to invalidate its results. A study with high risk of bias has significant methodological flaws (stemming from, for example, serious errors in design or conduct) that may invalidate its results. We considered the risk of bias for each relevant outcome of a study. When studies did not report sufficient detail to assess the validity of the design or study conduct, we judged the risk of bias to be unclear.

Data Synthesis

We had planned that if we found five or more similar studies that use a common design (all RCTs or all cohort) for a comparison of interest, we would consider quantitative analysis (i.e., meta-analysis) of the data from those studies.⁴⁹ We also planned to consider conducting mixed treatment comparisons meta-analysis using Bayesian methods to compare interventions with one another if we were able to identify a sufficient number of studies with a common comparator (e.g., waitlist). For all analyses, we intended to use random-effects models to estimate pooled or

comparative effects if quantitative analyses were warranted. For all outcomes, we present relative risks or mean differences, with confidence intervals, whenever calculable. For outcomes with multiple measures, we present forest plots (Appendix E).

To determine whether quantitative analyses were appropriate, we assessed the clinical and methodological heterogeneity of the studies under consideration following established guidance.⁵⁰ We did this by qualitatively assessing the PICOTS of the included studies, looking for similarities and differences.

Strength of the Body of Evidence

We graded the strength of a body of evidence based on the updated guidance in the *Methods Guide*.^{51,52} The AHRQ EPC approach incorporates five key domains: study limitations (includes study design and aggregate risk of bias), consistency, directness, precision of the evidence, and reporting bias. It also considers other optional domains that may be relevant for some scenarios, such as a dose-response association, plausible confounding that would decrease the observed effect, and strength of association (magnitude of effect). These domains are particularly relevant for observational studies. Thus, we considered these domains in addition to the five key domains for observational studies included in our review.

Two reviewers assessed each domain for each key outcome and resolved any differences by consensus discussion. Senior members of the review team (including at least one subject matter expert and one methodologist) graded the strength of evidence.

Grades reflect the confidence that the reviewers have that various estimates of effect are close to true effects with respect to the KQs in a systematic review. Table 2 defines the four grades.

Table 2. Definitions of the grades of overall strength of evidence⁵¹

Grade	Definition
High	We are very confident that the estimate of effect lies close to the true effect for this outcome. The body of evidence has few or no deficiencies. We believe that the findings are stable (i.e., another study would not change the conclusions).
Moderate	We are moderately confident that the estimate of effect lies close to the true effect for this outcome. The body of evidence has some deficiencies. We believe that the findings are likely to be stable, but some doubt remains.
Low	We have limited confidence that the estimate of effect lies close to the true effect for this outcome. The body of evidence has major or numerous deficiencies (or both). We believe that additional evidence is needed before concluding either that the findings are stable or that the estimate of effect is close to the true effect.
Insufficient	We have no evidence, we are unable to estimate an effect, or we have no confidence in the estimate of effect for this outcome. No evidence is available or the body of evidence has unacceptable deficiencies, precluding reaching a conclusion.

Risk of bias assessments for individual studies feed into the rating for the first of the strength of evidence domains, study limitations. Specifically, we rated bodies of evidence comprising trials with a high risk of bias as having high study limitations. Medium or unclear risk of bias studies resulted in medium study limitations. Low risk of bias studies resulted in low study limitations. In keeping with GRADE and strength of evidence guidance, we rated observational studies as having high study limitations.^{52,53}

As described above, study design and study limitations together set the baseline strength of evidence grade. Other domains then could either reduce or increase the grade. A body of

evidence with high study limitations, with no other reasons to increase confidence (dose-response, large magnitude of effect, plausible confounding) or decrease it (inconsistency, imprecision, indirectness, reporting bias) would generally have a low strength of evidence grade. A body of evidence with low study limitations, with no reasons to decrease confidence (inconsistency, imprecision, indirectness, reporting bias), would generally have a high strength of evidence grade. In other words, although study design and study limitation provide a baseline judgment of strength of evidence, each of four additional sources of uncertainty (inconsistency, imprecision, indirectness, reporting bias) serve to further reduce the strength of evidence grade.

For each source of uncertainty, we consistently used the following rubric to evaluate its effect on the overall strength of evidence across outcomes. Specifically, for indirectness, we rated intermediate outcomes as direct, rather than indirect, evidence. For this systematic review, these outcomes can be interpreted as direct measures of process change. Regarding consistency, we rated it as unknown for bodies of evidence with single studies; the rating of unknown consistency did not lower the overall grade. We relied on established guidance to judge precision.⁵⁴ Regarding imprecision, we specified the reasons for our judgment in footnotes to strength of evidence tables (small sample size or event rate, particularly when considering the optimum information size for the specific outcome, confidence intervals crossing the line of no difference or very wide confidence intervals). We downgraded the overall strength of evidence by two levels when we found multiple reasons for imprecision. We upgraded the evidence by one level for factors such as large magnitude of effect. Strength of evidence tables for each study are shown in Appendix F.

Applicability

We accessed applicability of the evidence following guidance from the *Methods Guide*.⁵⁵ We used the PICOTS framework to explore factors that affect applicability. Some factors relevant to the generalizability of our findings include the following:

- Patient characteristics in the study do not match typical characteristics of patients receiving mental health care.
- The study's health care delivery setting in the system or organization is not generalizable to typical settings.
- The nature of the comparison usual care group is not typical of the type of mental health care rendered in the system or organization or provided by practitioners.
- The types of practitioners in the organization the study employed does not match those in typical mental health care settings.
- The implementation of particular EBP interventions is not feasible in typical care settings.
- The intensity of the QI, implementation, or dissemination strategy employed by the study is not feasible to apply in practice.
- The timing of the strategy would be difficult to implement in typical care settings.

Peer Review and Public Commentary

Experts in QI, implementation, and dissemination strategies to improve the mental health care of children and adolescents were invited to provide external peer review of the draft systematic review. AHRQ staff and an Associate Editor reviewed the draft systematic review before it went out for peer review. The EPC Associate Editors are leaders in their respective

fields and are actively involved as directors or leaders at their EPCs. Their role is to assess adherence to established methodology and guidelines for EPC-based research. The draft report was posted on the AHRQ Web site from September 16, 2015, to October 13, 2015, to elicit public comment. We revised the report in response to reviewer comments, expanded the analysis strategies, and noted any resulting revisions to the text in the “Disposition of Comments Report.” This disposition report will be made available 3 months after the final systematic review is posted on the AHRQ Web site.

Additional Analyses in Response to Peer Review and Public Commentary

In response to feedback from peer reviewers and public commenters seeking additional contextual and actionable information on the complex interventions included in this review, we added two new sources of information (systematic searches and review of related publications and direct contact of study investigators) and conducted one additional method of analysis (qualitative comparative analysis). Our primary intent in conducting these additional analyses was to identify evidence or hypotheses on the success or failure of interventions.

Searches for Related Publications

Methodologists have suggested that single studies from complex interventions rarely contain information on how these interventions may work. Additional search approaches of related publications (known as “cluster searching”) may identify sibling (multiple publications on the same study) or kinship studies (publications from a common antecedent study or common theoretical foundation).⁵⁶ Although several strategies can assist with identifying related publications,⁵⁷ we focused on searches of authors and interventions (Appendix A). In reviewing the yield at the title and abstract stage, we used our formal inclusion and exclusion criteria with the exception of the study design criterion, because we were particularly interested in qualitative studies, evaluations of interventions, and theoretical studies. When evaluating full-text reviews, we matched full text to the likely original publication to understand cluster relationships and relevance of the findings to the original study.

Outreach to Authors

We also contacted study authors to obtain information about critical components for strategies of included studies. As part of a parallel project to better understand the uses and limitations of trial registries for data on outcomes, we reached out to study authors to elicit their views on critical components of included interventions (Appendix G). We listed differences between intervention arms and asked authors which of those differences was critical to investigators wishing to replicate their study.

Qualitative Comparative Analysis

Using the dataset abstracted for the primary synthesis, we used qualitative comparative analysis (QCA) to examine set relationships between combinations of strategy components and improvements in outcomes. QCA is a theory-driven approach that is particularly suited to understanding complex causal patterns within and across cases. QCA uses formal logic, a branch of mathematics, to examine combinations of conditions (in our study, components of a complex

intervention) and their relationship to an outcome. Individual conditions and combinations of conditions can be necessary, sufficient, or both to the outcome. Necessary conditions (and combinations of conditions) are antecedent to the outcome: the outcome cannot occur in the absence of the necessary condition. Sufficient conditions (and combinations of condition) guarantee the outcome (i.e., when the condition is present, the outcome is also present).^{58,59} For example, access to evidence-based interventions is necessary for uptake of evidence-based interventions, but it may not be sufficient for uptake; other variables may be necessary as well (e.g., administrative support for clinical staff).

QCA can accommodate qualitative data and quantitative data within the same analysis and offers a systematic way for evaluating causal complexity because it is based on formal logic and set theory, not statistical theory. Traditional variable-oriented methods typically deconstruct the unit of analysis into its component variables and then assess statistical correlations among one or more variables, but this may not be the best approach for complex interventions. QCA can identify multiple “recipes” or sufficient combinations for achieving an outcome; in other words, one size does not fit all. For example, in Kahwati et al.’s application of QCA to a systematic review on medication adherence, the authors found several *combinations of behavioral techniques* in included studies that led to improved adherence.^{60,61} Several authors describe QCA methods in greater detail.^{59,60,62-65} We based our methods on the approach used by Kahwati et al. in a recent QCA of medication adherence studies.^{60,65} We included as many of the studies in this review as possible, but we recognized this may not be feasible or always appropriate (e.g., when a study did not report a particular outcome).

Specific analytic steps are described in Appendix H.

Results

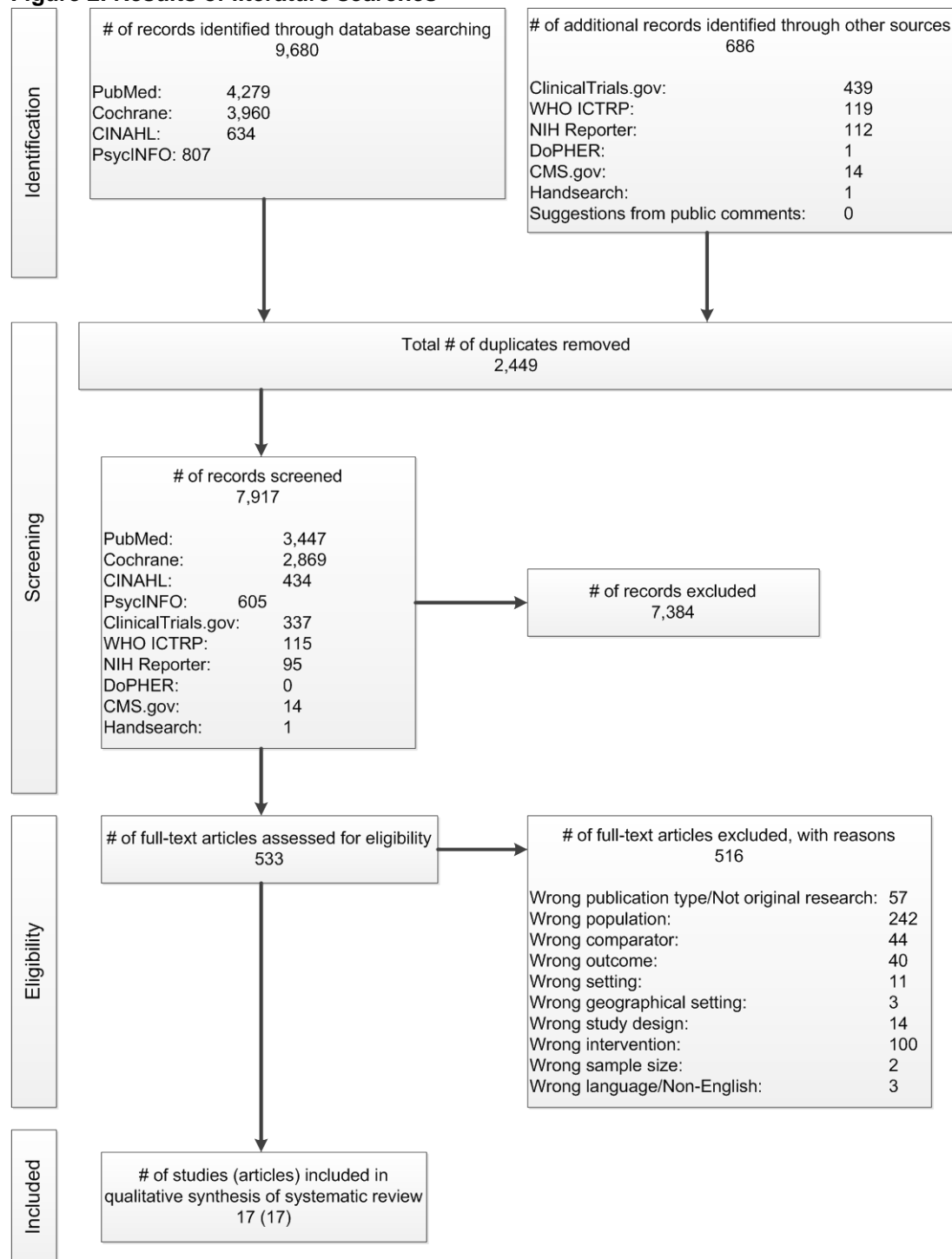
Introduction

This section presents the findings of this systematic review, starting with the results of the literature searches and description of included studies. The findings for each Key Question (KQ) present an overview of the identified evidence, followed by key points and detailed results. Detailed results include a description of relevant studies, intermediate outcome findings, patient health and service utilization outcomes, risk of bias considerations (with rating presented in full in Appendix D), and strength of evidence grades for each study. KQ 1 studies are presented individually. We synthesized the results qualitatively rather than quantitatively because of high levels of heterogeneity in the number and types of strategy components, differences between the experimental and control arms (i.e., in some studies, a single component distinguished strategy and control arms, and in other studies, several components differed between arms), and outcomes assessed. We relied on author-reported measures of differences between groups and associated variances, but when these were not reported, we calculated differences and computed odds ratios (ORs) or mean differences, along with 95% confidence intervals (CIs) for between-arm comparisons.

Results of our searches appear in Figure 2. We reviewed 7,917 titles and abstracts dually and independently and identified 533 articles for full-text review. Because of the lack of standard terminology used to define the types of studies of interest to this review, we used a wide-ranging search strategy. As a result, many citations were not relevant, leading to a much smaller pool of included studies at the full-text review stage. We excluded 516 of these articles at the full-text review stage, leaving 17 articles representing 17 studies (one article reports on two different studies,⁶⁶ and another two articles^{67,68} report outcomes for the same trial). Common reasons for exclusion included not meeting review criteria for population (i.e., not focusing on health care systems, organizations, or practitioners that provide mental health care for children and adolescents with mental health problems [n=242]), not meeting review criteria for comparator (i.e., not including a comparator [n=44]), not meeting review criteria for intervention (i.e., quality improvement [QI], implementation, and dissemination strategies [n=100]), not meeting review criteria for publication type (cross-sectional studies, nonsystematic reviews [n=57]), and not meeting review criteria for outcome (included only patient health outcomes or only intermediate outcomes for strategies not implementing an evidence-based practice [EBP] [n=40]).

All full-text studies had a minimum of two independent reviewers, but for several studies, applying the inclusion/exclusion criteria consistently and reliably required multiple iterations of full-text review, often culminating in group discussions with the entire team to reach consensus. Our challenges arose from the process of applying consistent logic when encountering new or unanticipated “boundary” cases, the complexity of included studies, and the inadequacy of reporting in some instances. Several studies that were otherwise eligible were eventually excluded because they examined efficacy or effectiveness instead of the impact of a QI, implementation, or dissemination strategy.⁶⁹⁻⁷³ In other instances, we excluded studies otherwise eligible for having the wrong comparator: we could not distinguish the effects of the strategy of interest (QI, implementation, or dissemination) from the underlying EBP.⁷⁴⁻⁸⁰ We encountered strategies that used teachers and nonmental health care practitioners that we judged to be ineligible because they were not providers of mental health care.^{81,82} Some studies had relevant

Figure 2. Results of literature searches



strategies but were directed at children who were *at risk of* but were not *identified with* mental health problems.⁸³ One study also required contacting the authors to obtain additional details on the care received by usual-care participants, which was unclear in the published article.⁷⁴⁻⁷⁷ We did not identify any relevant studies upon our review of the English-language abstracts of non-

English-language studies. A complete list of articles that were excluded during full-text review can be found in Appendix C.

Seventeen published articles met the review inclusion criteria. One article included 2 studies within the same publication,⁶⁶ and another trial reported outcomes in 2 separate papers.^{67,68} All 17 included studies (17 articles) addressed KQ 1, with 7 studies examining strategies classified as professional training studies and 10 studies examining strategies classified as financial or organizational change studies based on categorizing components based on the Effective Practice and Organisation of Care (EPOC) taxonomy. One of the included articles addressed KQ 2, and 4 articles were identified that addressed KQ 3. The evidence base included randomized controlled trials (RCTs),^{13,14,66-68,84-92} controlled clinical trials (CCTs),^{93,94} interrupted time series,⁹⁵ and cohort designs.⁶⁶ Additional details describing the included studies are provided in the relevant sections of this results section and at <http://srdhr.ahrq.gov/projects/530>.

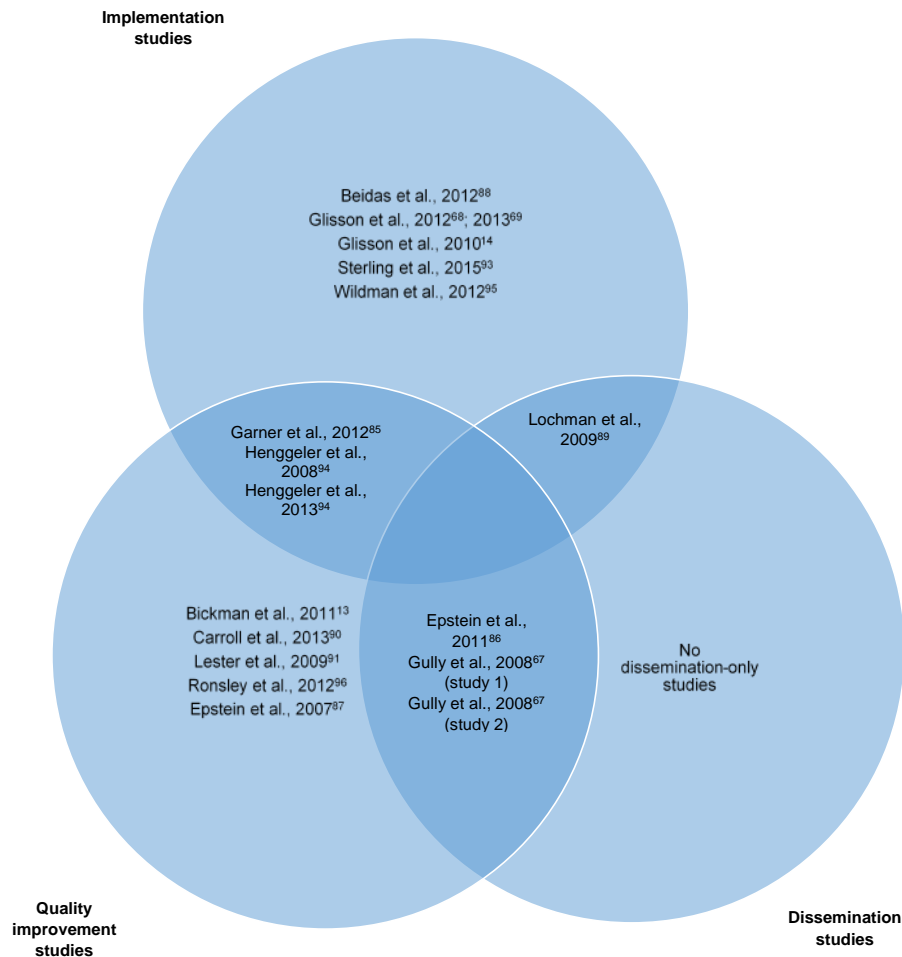
In addition, we searched for related publications to extract contextual information on the reasons for success or failure of strategies. Our searches yielded 1,158 citations of which we reviewed 33 full-text studies. Six studies provided additional contextual information and were incorporated in the results pertaining to each intervention. Additionally, we found two articles that contributed to our evidence base. Specifically, one article⁶⁸ contributed new outcomes to an already included study; we constructed an add-on search to capture its indexing terms. We included a second article in the review as a new study, arising from handsearches.⁹¹ PubMed indexed it as an adult rather than a child study; as a result, we did not capture it in our systematic searches.

We also reached out to principal investigators or their surrogates to elicit their views on the critical components of the strategies included in this review. Three investigators (lead investigators on two studies and one proxy for two studies with a deceased principal investigator) did not respond to our repeated outreach attempts. A fourth respondent refused because of lack of time, and a fifth responded to us but was unable to provide us with information because the principal investigator (lead on two studies) was deceased. Investigators for the remaining 10 studies listed critical components or contextual factors, which we present in the results below.

Description of Included Studies

Our review focused on 17 included studies from 17 publications.^{13,14,66-68,84-95} One of these studies addressed KQ 2 (harms) and four addressed KQ 3 (moderators of effectiveness). We first attempted to categorize each strategy by whether it focused on QI, implementation, or dissemination according to our definitions, but we encountered several difficulties. First, our categorizations—assessed independently by two reviewers, with conflicts resolved by consensus—did not always match the study authors' categorization (QI, implementation, or dissemination). Second, the complexity of several of the strategies meant that we could not assign studies to mutually exclusive categories for QI, implementation, or dissemination. We judged that 7 of 17 studies could be classified as having dual categories (Figure 3). Third, studies within the same category (QI, implementation, or dissemination) did not have sufficient similarities in strategy components to enable meaningful synthesis of findings.

Figure 3. Venn diagram representing study team’s original classification of included studies



As a result of these difficulties, we decided to categorize each of the strategies according to the EPOC taxonomy, indicating each of the professional, organizational, financial, or regulatory components that were present. No included studies contained regulatory components. Because many of the comparison groups also contained several of these components, we marked the components contained in each treatment and comparison group (i.e., study arm). This allowed us to fully describe the numerous components that were being combined and tested in each strategy and enabled us to determine whether the study arms differed by a single or multiple components. Appendix B provides the full table of EPOC taxonomy components contained in each strategy by study arm; Table 3 presents a summary version of this table with descriptions of strategy components and differences by study arms. Strategies with one or more financial or organizational components were classified as “financial or organizational change” strategies, and strategies with only professional components were classified as “professional training” strategies. These categories guided our qualitative synthesis. Our outreach to investigators to identify critical components yielded responses for 10 included strategies. Of these, 8 highlighted specific interventions. Specifically, 4 cited training, 3 cited feedback, 1 cited referral processes, and 1 cited financial incentives. One investigator cited a contextual factor, specifically the recruitment of patients from community-based pediatric practices.

Table 3. Summary table of strategies tested

Author Study Arms	Target Condition and Ages of Youth	QI/ID ^a	Primary Categori- zation	Number and Types of EPOC Components Included in Strategy	Differences Across Study Arms Critical Components for Replication as Identified by Study Authors (personal communication)
Beidas et al., 2012 ⁸⁷ <i>Augmented active learning vs. computerized routine vs. routine professional training workshop to implement an EBP (three arms)</i>	Anxiety 8–17 years	I	Professional training	2 professional components (distribution of educational materials in one arm, educational meetings in two arms, plus one “other” component in all three arms—weekly consultation via virtual conferencing platform for 3 months after training)	Single difference across arms in the method of training program delivery (distribution of program’s educational materials delivered via the computer in one group vs. workshop with behavioral role play and small group activities in another group vs. workshop with didactic instruction only in routine professional training group) Augmented training: focus on principles of treatment and use of experiential learning; the ongoing support/consultation
Bickman et al., 2011 ¹³ <i>Weekly and cumulative 90-day feedback vs. cumulative 90-day feedback only on patient symptoms and functioning to practitioners</i>	General mental health problem (children who receive home-based mental health treatment) Mean=15 years	QI	Financial or organizational change	5 professional components (distribution of educational materials, educational meetings, patient-mediated interventions, audit and feedback, and one other—individual support by phone or email) 1 organizational structural component (quality monitoring)	Single difference across arms (frequency of audit and feedback mechanism—weekly and cumulative 90-day vs. cumulative 90-day feedback to practitioners only), although classified as a financial or organizational change strategy because strategy required a structural change of quality monitoring Feedback
Carroll et al., 2013 ⁸⁹ <i>Computer decision support plus electronic health record (EHR) that included diagnosis and treatment guidelines vs. computer decision support plus EHR only</i>	General mental health problem (children who receive home-based mental health treatment) Mean=15 years	QI	Financial or organizational change	2 professional components (patient-mediated intervention and reminders) 1 organizational structural component (quality monitoring)	All components differed across arms (computer decision support plus EHR-only group included none of these components) NR

Table 3. Summary table of strategies tested (continued)

Author Study Arms	Target Condition and Ages of Youth	QI/I/D ^a	Primary Categori- zation	Number and Types of EPOC Components Included in Strategy	Differences Across Study Arms Critical Components for Replication as Identified by Study Authors (personal communication)
Epstein et al., 2011 ⁸⁵ <i>Internet portal providing practitioner access to practice guidelines vs. wait- list control</i>	Attention deficit hyperactivity disorder (ADHD) 6 to 12 years	QI/D	Financial or organizational change	5 professional components (distribution of educational materials, educational meetings, patient-mediated interventions, audit and feedback, and reminders) 1 financial component (provider incentives) 2 organizational structural components (quality monitoring and staff organization)	All components differed across arms (wait-list control group included none of these components) An Internet-based platform through which parents, teachers, and pediatricians input information about the target child during initial ADHD assessment and treatment, which then resulted in a report and change in office flow
Epstein et al., 2007 ⁸⁶ <i>Collaborative consultation treatment service to promote the use of titration trials and periodic monitoring during medication management vs. control</i>	ADHD Mean age=7 years	QI	Financial or organizational change	1 professional component (audit and feedback) 1 organizational provider- oriented component (clinical multidisciplinary teams)	All (both) components differed across arms (control group included neither of these components) Recruitment of patients from community-based pediatric practices.
Garner et al., 2012 ⁸⁴ <i>Paying practitioners for performance in successfully delivering an EBP intervention vs. implementation as usual (IAU)</i>	Substance use disorders Mean age=16 years	QI/I	Financial or organizational change	4 professional components (distribution of educational materials, educational meetings, educational outreach visits, and one other—feedback from trained raters and weekly phone calls from developers) 2 financial provider components (provider incentives and provider grant/allowance)	Single difference across arms in provider incentives Financial incentives provided to the staff delivering the intervention

Table 3. Summary table of strategies tested (continued)

Author Study Arms	Target Condition and Ages of Youth	QI/ID ^a	Primary Categori- zation	Number and Types of EPOC Components Included in Strategy	Differences Across Study Arms Critical Components for Replication as Identified by Study Authors (personal communication)
Glisson et al., 2012 ^{67,68} <i>Program to improve organizational climate and culture vs. control</i>	General mental health problems 8–24 years	I	Financial or organizational change	5 professional components (distribution of educational materials, educational meetings, educational outreach visits, audit and feedback, and one other— training and cognitive models to improve effectiveness) 1 organizational provider- oriented component (satisfaction of providers with conditions of their work)	All components differed across arms (control group included none of these components) The ARC intervention strategies depend on trained specialists who work at all levels of a service system to (a) embed guiding principles for improving services, (b) develop shared mental models among organizational members to support the improvement effort, and (c) enact organizational tools (e.g., feedback) for identifying and addressing service barriers
Glisson et al., 2010 ¹⁴ <i>Program to improve organizational climate and culture vs. control</i>	Externalizing behaviors (youth referred to juvenile court with behavioral or psychiatric symptoms that require intervention) 9–17 years	I	Financial or organizational change	5 professional components (distribution of educational materials, educational meetings, educational outreach visits, audit and feedback, and one other— training and cognitive models to improve effectiveness) 1 organizational provider- oriented component (satisfaction of providers with conditions of their work)	All components differed across arms (control group included none of these components) The ARC intervention strategies depend on trained specialists who work at all levels of a service system to (a) embed guiding principles for improving services, (b) develop shared mental models among organizational members to support the improvement effort, and (c) enact organizational tools (e.g., feedback) for identifying and addressing service barriers
Gully ^b et al., 2008 ⁶⁶ <i>Protocol to train nurses to educate parents about EBPs vs. typical services</i>	General mental health symptoms (children suspected of abuse during forensic medical examinations) 2–17 years	QI/D	Professional training	4 professional components (distribution of educational materials, educational meetings, educational outreach visits, patient- mediated interventions)	All components differed across arms (typical services group included none of these components) NR

Table 3. Summary table of strategies tested (continued)

Author Study Arms	Target Condition and Ages of Youth	QI/I/D ^a	Primary Categori- zation	Number and Types of EPOC Components Included in Strategy	Differences Across Study Arms Critical Components for Replication as Identified by Study Authors (personal communication)
Henggeler et al., 2008 ⁹³ <i>Intensive Quality Assurance (IQA) system vs. workshop only to implement an EBP intervention</i>	Substance use disorders (adolescents with marijuana abuse) 12–17 years	QI/I	Financial or organizational change	4 professional components (distribution of educational materials, educational meetings, educational outreach visits, and one other—drug screen tests and supplies) 1 financial provider component (other—money to facilitate treatment goals via a voucher system) 1 financial patient component (patient incentives) 1 organizational structural component (quality monitoring)	Two of 7 components differed across arms (patient incentives and quality monitoring were not part of the workshop-only group) NR
Henggeler et al., 2013 ⁹¹ <i>Workshop and resources (WSR) vs. WSR and computer-assisted training (WSR+CAT) vs. WSR+CAT and supervisory support (WSR+CAT+SS) to implement an EBP intervention</i>	Substance use disorders 12–17 years	QI/I	Professional training	5 professional components (distribution of educational materials, educational meetings, educational outreach visits, and two other—drug screens and supplies and continuing education credits) 1 financial patient component (vouchers for providers to hand out to youth)	Two of 6 components differed across arms (only the WSR+CAT+SS group had site visits and telephone consultations between EBP experts and therapist supervisors and educational materials differed in intensity among the three groups) NR
Lester et al., 2009 ⁹⁰ <i>Professional training to identify and refer cases vs. usual care</i>	Psychosis (adolescents and adults with first- episode psychosis) 14–30 years	QI	Professional training	4 professional components (educational meetings, local consensus process, educational outreach visits, and marketing)	All components differed across arms (control group included none of these components) NR

Table 3. Summary table of strategies tested (continued)

Author Study Arms	Target Condition and Ages of Youth	QI/I/D ^a	Primary Categori- zation	Number and Types of EPOC Components Included in Strategy	Differences Across Study Arms Critical Components for Replication as Identified by Study Authors (personal communication)
Lochman et al., 2009 ⁸⁸ <i>Professional training plus feedback to implement an EBP intervention vs. professional training only to implement an EBP intervention vs. control (three arms)</i>	Externalizing behaviors (children at risk for aggressive behaviors) Third-grade students	D/I	Professional training	5 professional components (educational materials, educational meetings, audit and feedback, marketing, and one other—monthly ongoing training sessions)	Difference across the three study arms varied (training plus feedback group had all five components, training-only group had educational meetings and marketing components, and control group had none of these components) Audit and feedback components where trainers reviewed the rate of completion of session objectives and provided individualized supervisory feedback
Ronsley et al., 2012 ⁹⁵ <i>Patient medication monitoring training program for practitioners vs. usual care</i>	Psychosis <19 years (mean=11)	QI	Professional training	5 professional components (educational materials, educational meetings, educational outreach visits, reminders, and one other— online access and project coordinator)	All components differed across arms (usual-care group included none of these components) NR
Sterling et al., 2015 ⁹² <i>Pediatrician only vs. embedded BHCP implementation of an EBP</i>	Patients ages 1 12–18 attending a pediatric primary care office	I	Financial or organizational change	1 organizational provider- oriented component (clinical multidisciplinary teams)	Single difference across arms (embedded BHCP implementation of Screening, Brief Intervention, and Referral to Treatment [SBIRT] vs. pediatrician-only implementation of SBIRT) Brief training in how to deliver SBIRT in the pediatrician-only arm; embedding a BHCP in the BHCP arm
Wildman et al., 2009 ⁹⁴ <i>Colocation of an EBP program in primary care vs. enhanced referral to an EBP program</i>	Externalizing behavior problems 2–12 years	I	Financial or organizational change	2 organizational structural components (changes in scope and nature of benefits and services and one other—choice of treatment)	Single difference across arms (choice of treatment was not included in the enhanced referral group) Creating easy referral procedures for primary care providers to use for behavioral health care

^a Original categorization made by study team.

^b Applicable to both studies included in this publication.

ADHD = attention deficit hyperactivity disorder; ARC = Availability, Responsiveness and Continuity; BHCP = behavioral health care practitioner; CAT = computer-assisted training; EBP = evidence-based practice; EPOC = Effective Practice and Organisation of Care; EHR = electronic health record; IAU = implementation as usual; MST = multisystemic therapy; NR = no response; QI/I/D = quality improvement\implementation\dissemination; SBIRT = Screening, Brief Intervention, and Referral to Treatment; SS = supervisory support; vs. = versus; WSR = workshop and resources.

Table 4 exhibits study characteristics of included studies organized by primary component of strategy according to the EPOC taxonomy (i.e., professional training or financial or organizational change).

Seven studies had unclear risk of bias, 1 had low, 3 had medium, and 6 had high. Most studies were RCTs or CCTs. The majority were clustered at the practitioner, practice, or organizational level. The other two studies included an interrupted time-series study and a cohort study with a historical control. Seven of the studies focused on professional training (i.e., only included professional components), while the other 10 studies focused on financial or organizational changes (i.e., included at least one financial or organizational component). Settings included primary care, community health, and schools. Each included study is reported in detail by KQ below. Full evidence tables are available at <http://srdr.ahrq.gov/projects/530>.

Table 4. Strategies to improve mental health of children and adolescents: Study characteristics

Study Descriptor	Characteristics	Primary Strategy: Professional Training ^a	Primary Strategy: Financial or Organizational Change ^b	Total
Design	RCT	2	0	2
	2-stage RCT	0	1	1
	Cluster RCT	3	7	10
	CCT	0	2	2
	Non-RCT	2	0	2
Setting	Primary care	1	2	3
	Community mental health	4	8	12
	School	1	0	1
Strategy categorization ^c	Quality improvement	2	3	5
	Implementation	1	4	5
	Dissemination	0	0	0
	Hybrid QI and I	1	2	3
	Hybrid QI and D	2	1	3
	Hybrid I and D	1	0	1
Risk of bias	Low	1	0	1
	Medium	0	3	3
	High	3	4	6
	Unclear	4	3	7
Key question	KQ 1	7	10	17
	KQ 2	1	0	1
	KQ 3	1	3	4
Total N of studies		7	10	17

^a Included all professional components.

^b Included at least 1 financial or organizational component.

^c Categories dually assigned by members of the study team according to the definitions of QI, I, and D included in the PICOTS.

CCT = controlled clinical trial; D = Dissemination; I = Implementation; KQ = Key Question; QI = quality improvement; RCT = randomized controlled trial.

Key Question 1. Effectiveness of Strategies

Each of the 17 included studies from 17 publications^{13,14,66-68,84-95} addressed our first KQ on strategy effectiveness. Key points and additional details of intermediate and patient health and service utilization outcomes overall and by the primary component of the strategy are shown in Table 5, according to our classification based on the EPOC taxonomy.

Table 5. Intermediate and patient health and service utilization outcomes by primary component of strategy

Outcome Category	Outcomes	Professional Training ^a (7 Studies)	Financial or Organizational Change ^b (10 Studies)	Total
Intermediate outcome: practitioner	Satisfaction/acceptability	1	1	2
	Adherence/fidelity	3	8	11
	Competence/skills	2	2	4
Intermediate outcome: system	Feasibility	0	0	0
	Uptake	1	0	1
	Timeliness	0	0	0
	Penetration	0	0	0
	Sustainability	0	0	0
Intermediate outcome: patient	Resources (including costs)	0	0	0
	Access to care	3	1	4
	Satisfaction	2	0	2
	Treatment engagement	2	0	2
	Therapeutic alliance with provider	2	0	2
Patient health and service utilization outcome	Changes in mental health status	2	4	6
	Comorbid mental, substance use, developmental disorders	0	0	0
	Mortality	0	0	0
	Socialization skills and behaviors	1	0	1
	Functional status	0	1	1
	Quality of life	0	0	0
	Service utilization	2	2	4
Patient health and service utilization outcome not reported	N/A ^c	4	3	7
Total		7	11	17

^a Included all professional components.

^b Included at least 1 financial or organizational component.

^c N/A = Not applicable because the strategy employed an EBP intervention, which has known benefits to these outcomes.

EBP = evidence-based practice.

Key Points: Characterization of Strategies

We categorized the strategies tested in 7 studies as spanning multiple categories of our original three classifications: QI, implementation, or dissemination. This overlap prompted us to use a different system, based on the EPOC taxonomy, to ultimately classify strategies as professional training (i.e., strategies that comprised only professional components) or financial or organizational change (i.e., strategies that comprised at least one financial or organizational component).

- We categorized 7 of the studies as examining professional training strategies and 10 of the studies as examining financial or organizational change strategies.
- The strategies tested all had multiple components, some of which spanned EPOC groupings of categories (e.g., professional, organizational, financial).
- The number of components differing between arms (treatment vs. control) varied by study; 5 studies had single-component differences across arms (i.e., a single active

component) and 12 studies had multiple-component differences across arms (i.e., multiple active components).

- Among investigators who responded to our inquiries regarding critical components, 4 highlighted training, 3 focused on feedback, 1 noted referral processes, 1 cited financial incentives, and 1 cited the recruitment of patients from community-based pediatric practices.

Intermediate Outcomes

Practitioner Outcomes

We found studies that examined each of our three prespecified practitioner intermediate outcomes: satisfaction with or acceptability of approach (n=2), protocol adherence or program model fidelity (n=11), and competence/skill (n=4).

- For practitioner satisfaction with or acceptability of approach, we found low strength of evidence for no benefit of one professional training study and low strength of evidence for benefit of one financial/organizational study.
- For protocol adherence or program model fidelity, strength of evidence varied based on the specific strategy. We did not find consistent evidence that the type of strategy was associated with a direction or strength of evidence; for example, we found low strength of evidence of *benefit* as well as low strength of evidence for *no benefit* and insufficient evidence for strategies with professional training. The same holds true for strategies with a financial/organizational component.

System Outcomes

A single study evaluated the prespecified system intermediate outcomes of uptake.

- We found insufficient strength of evidence to judge the benefit of a strategy testing for the use of a workshop plus resources (with or without computer-assisted training) plus resources to implement an EBP intervention vs. the workshop plus resources only.

Patient Outcomes

Four types of prespecified patient intermediate outcomes were reported: patient access to care (n=4), patient satisfaction (n=2), treatment adherence (n=2), and therapeutic alliance (n=2).

- For patient access to care intermediate outcomes, strength of evidence varied based on the specific strategy.
- For other three patient intermediate outcomes—patient satisfaction, treatment adherence, and therapeutic alliance—we found low strength of evidence for benefit from two studies each.

Key Points: Patient Health and Service Utilization Outcomes

Seven studies did not report a patient health or service utilization outcome because the strategy employed an EBP. For these studies, positive intermediate outcomes were assumed to have positive effects on patient outcomes. Six studies reported on changes in mental health status (e.g., symptoms, recovery, remission), one on socialization skills and behaviors, one on functional status, and four on service utilization.

- For mental health status outcomes, strength of evidence varied based on the specific strategy (n=6).
- For changes in socialization skills and behaviors, in one study with three arms, we found low strength of evidence for benefit of professional training plus feedback to implement an EBP intervention versus control, and low strength of evidence for no benefit of professional training only to implement an EBP intervention versus control.
- For changes in functional status outcomes, we found low strength of evidence for benefit of a financial or organizational change strategy (n=1) testing weekly and cumulative 90-day versus cumulative 90-day feedback to practitioners that had a single active component, a quality monitoring mechanism.
- The strength of evidence for service utilization outcomes varied based on the specific strategy (n=4).

Key Points: Qualitative Comparative Analysis Findings

The model from qualitative comparative analysis (QCA) that best explained the data looked at the presence of several components. These included educational materials or meetings, educational outreach components, patient-mediated intervention components, audit and feedback, one or more reminders components, one or more financial components, use of a clinical multidisciplinary team, and changing of the scope of patient benefits. The model evaluated these components in relation to having a statistically significant improvement in a majority of the practitioner-, system-, and patient-level intermediate outcomes tested (and rated as having at least low strength of evidence for benefit) or having at least low strength of evidence for benefit for at least one patient health or service utilization outcome (and rated as having at least low strength of evidence for benefit).

Solutions

- The QCA identified seven solutions, which accounted for 83.3 percent of the studies that achieved the outcome.
- Four solutions represented single studies.
- The other three solutions encompassed a mix of components found in seven studies that achieved success.

Detailed Synthesis

Professional Training Strategies

Seven studies reported in six publications focused on professional training strategies.^{66,87,88,90,91,95} These studies each included various professional components according to the EPOC taxonomy and no financial or organizational components. Studies included a maximum of five professional components. Components included distribution of educational materials, educational meetings, local consensus processes, educational outreach visits, patient-mediated interventions, audit and feedback, reminders, marketing, individual support by phone or email, project coordinator assistance, and monthly ongoing training sessions.

One strategy targeted school counselors, five targeted community-based mental health providers, and one targeted general practitioners. One of these studies ultimately targeted general practitioners who treated children and adolescents with psychosis,⁹⁰ two targeted community-

based mental health practitioners,^{91,95} one targeted community therapists treating children with anxiety,⁸⁷ one targeted school counselors attempting to prevent externalizing behaviors among children at high risk of aggressive behaviors,⁸⁸ and two studies reported in one publication targeted nurses who encountered children and adolescents who were suspected victims of abuse.⁶⁶ Details of each of these studies are described below.

Adding an Active Learning Component to a Professional Training Workshop To Implement an EBP

Study Description

One RCT⁸⁷ (low risk of bias), conducted in 2009, focused on implementing cognitive behavioral therapy (CBT). Specifically, it evaluated the effectiveness of three 6-hour training modalities of CBT for anxiety in youth and the impact of ongoing consultation after training. Participants were 115 community therapists randomly assigned to one of three 1-day workshops to examine the effectiveness of the training modality: routine training (RT, training as usual, n=41), computer training (CT, computerized training as usual, n=34), and augmented training that emphasized active learning (AT, n=39). After the workshops, all participants received 3 months of ongoing consultation that included case consultation, didactics, and problem solving.

Participants included community therapists (mean age=35.9, 90% female) working in the community with children ages 8 to 17 with anxiety disorders who had not had more than 8 hours of prior CBT training for child anxiety. Outcomes measured at baseline and at posttraining included a measure of training satisfaction (range 12–60), a knowledge test of CBT for youth anxiety (range 0–20), and a measure of therapist fidelity that included adherence as assessed by six CBT competencies (range 0–6) and the therapist's competence as rated by a coder blind to treatment condition (range 1–7). Authors compared the means across treatment groups at posttreatment using t-tests; we calculated mean difference scores and 95% CIs of differences between the AT and RT groups and the CT and RT groups.

Therapists participated in an additional role-playing exercise at posttraining and 3-month followup (postconsultation) that involved simulated clinical situations where therapists encountered a research assistant acting as a child with anxiety seeking care. Independent assessors coded digital recordings of these sessions to determine the proportion of therapists in each training condition trained to adherence, skill, and knowledge criteria.

Intermediate Outcomes

All three modalities resulted in limited gains in therapist adherence, skill, or knowledge (Table 6). All groups improved in adherence to CBT measured by an Adherence Skills Checklist, participant skill (level of competence shown by the therapist in delivering treatment), and knowledge of CBT for youth anxiety, but the study found no significant effect on training or interaction of time and training. In addition, the proportion of therapists trained to criterion did not differ across treatment groups for adherence, skill, or knowledge. The study found differences in satisfaction across training modalities ($F=7.22$, $df=2$ and 112 , $p<0.001$), with participants in the CT group reporting lower satisfaction scores than the RT group (50.8 ± 5.9 vs. 53.7 ± 5.4 ; calculated mean difference, -2.9 ; 95% CI, -5.46 to -0.340 ; $p=0.03$). Satisfaction did not significantly differ between the AT group and the RT group.

A companion qualitative analysis explored barriers and facilitators to implementation among therapists⁹⁶ and found that client, intervention, and organizational factors played important roles. Client-level barriers included the presence of complex issues and multiple comorbidities and

psychosocial stressors, low motivation, and younger age. Client-level facilitators included higher motivation and functioning. Regarding intervention-level factors, the structured nature of CBT served as a barrier for some and facilitator for others. Therapists cited the school setting as a barrier when it prevented them from allocating the required time in each session but as a facilitator when it provided access to youths. Therapists also noted support at work (through supervision) and autonomy as organizational facilitators. A second companion study focused on inner-setting variables, specifically, perceptions of organizational climate and adopter characteristics, as predictors of fidelity and penetration of the intervention.⁹⁷ It reported that as individual perceptions of organization climate increased, adherence also increased. However, greater experience and more positive attitudes to the intervention were associated with lower adherence, suggesting a complex relationship between adopter characteristics and intervention fidelity. Neither adopter characteristics nor perceptions of organizational climate predicted penetration of the intervention.

Table 6. Adding an active learning component to a professional training workshop to implement an EBP: Summary of results

Study Arms				
Study Design/Risk of Bias	Differences in Strategy Components Across Study Arms	N Analyzed	Outcome Reported by Study and Time Period	Results
Beidas et al., 2012 ⁸⁷ RCT/Low	G1: Augmented active learning professional training workshop to implement an EBP intervention (CBT)	G1: 40 G2: 34 G3: 41	Practitioner adherence to CBT: mean posttraining score difference G1–G3 and G2–G3 and differences in proportion of community therapists trained to criterion at posttraining (after a 1-day workshop) and postconsultation (after 3 months of followup consultation)	Mean post difference G1–G3: 0.43, 95% CI, -0.17 to 1.03 (calculated) Mean post difference G2–G3: -0.22, 95% CI, -0.89 to 0.45 (calculated) Posttraining G1 vs. G3 OR, 0.94, 95% CI, 0.39 to 2.30 G2 vs. G3 OR, 0.56, 95% CI, 0.21 to 1.48 Postconsultation G1 vs. G3 1.43, 95% CI, 0.55 to 3.73 G2 vs. G3 OR, 0.93, 95% CI: 0.35 to 2.49 (calculated)
	G2: Computerized routine professional training workshop to implement an EBP intervention (CBT)		Practitioner skill: mean posttraining score difference between G1–G3 and G2–G3 and differences in proportion of community therapists trained to criterion at posttraining (after a 1-day workshop) and postconsultation (after 3 months of followup consultation)	Mean post difference G1–G3: -0.45, 95% CI, -1.10 to 0.20 (calculated) Mean post difference G2–G3: -0.46, 95% CI, -1.14 to 0.22 (calculated) Posttraining G1 vs. G3 OR, 2.00, 95% CI, 0.75 to 5.34 G2 vs. G3 OR, 0.68, 95% CI, 0.27 to 1.71 Postconsultation G1 vs. G3 OR, 0.94, 95% CI, 0.39 to 2.30 G2 vs. G3 OR, 0.97, 95% CI, 0.29 to 3.26 (calculated)
	G3: Routine professional training workshop to implement an EBP intervention (CBT)			
	Single difference across arms: distribution of educational materials delivered			

Table 6. Adding an active learning component to a professional training workshop to implement an EBP: Summary of results (continued)

Study Arms				
Study Design/Risk of Bias	Differences in Strategy Components Across Study Arms	N Analyzed	Outcome Reported by Study and Time Period	Results
	via the computer in one arm vs. workshop with behavioral role play and small group activities in another arm vs. workshop with didactic instruction only in comparison arm		Practitioner knowledge: mean posttraining score difference between G1–G3 and G2–G3 and differences in proportion of community therapists trained to criterion at posttraining (after a 1-day workshop) and postconsultation (after 3 months of followup consultation)	Mean post difference G1–G3: -0.62, 95% CI, -1.45 to 0.21 (calculated) Mean post difference G2–G3: -0.03, 95% CI, -0.87 to 0.81 (calculated) Posttraining G1 vs. G3 OR, 1.50, 95% CI, 0.24 to 9.49 G2 vs. G3 OR, 2.61, 95% CI, 0.26 to 26.3 Postconsultation G1 vs. G3 OR, 1.07, 95% CI, 0.06 to 17.8 G2 vs. G3 OR, 0.39, 95% CI, 0.03 to 4.53 (calculated)
			Practitioner satisfaction: mean satisfaction score (range 12-60) difference between G1-G3 and G2-G3	Mean post difference G1-G3 (calculated): 1.8, 95% CI, -0.423 to 4.023, p=0.11 Mean post difference G2-G3 (calculated): -2.9, t=-3.78, df=112, p<.001

CBT = cognitive behavioral therapy; CI = confidence interval; EBP = evidence-based practice; G = group; N = number; OR = odds ratio; RCT = randomized controlled trial; vs. = versus.

Patient Health and Service Utilization Outcomes

The study did not report patient health and service utilization outcomes because the investigators implemented an EBP (CBT for anxiety).

Risk of Bias Considerations

We rated this study as having low risk of bias. Most procedures used by the study authors did not raise risk of bias concerns. One exception is that the authors randomized the therapists to treatment condition by date of enrollment, although allocation to group was concealed. Another minor concern was that the authors did not report differences in baseline characteristics between groups, and baseline differences, if significant, were uncontrolled in analyses. Attrition was 2 percent at posttraining and 12 percent at postconsultation (3-month followup) assessment.

Conclusion and Strength of Evidence

We graded the strength of evidence on a strategy on adding active learning to a professional training workshop for community therapists to implement an EBT, CBT for youth anxiety, as low for no benefit. The evidence consisted of a single publication that presented data from an RCT with low risk of bias, small sample size, and imprecise results. Specifically, the strategy included educational materials or meetings. It did not improve practitioner (1) satisfaction with or acceptability of approach, (2) protocol adherence or program model fidelity, or (3) skills or knowledge (Table F-1).

Training Nurses To Educate Parents About EBPs

Study Description

Two studies in one publication⁶⁶ examined a nurse-provided EBP intervention (high risk of bias) delivered to parents or caregivers to increase access to evidence-based mental health treatment for children ages 2 to 17 years who were suspected victims of abuse. The authors describe two studies; the first was cohort study with a historical control, and the second was an RCT. In Study 1, nurses at hospitals and community-based treatment centers received the EBP intervention, following which the investigators collected data from parents and caregivers. The comparison data came from the same study sites prior to the EBP intervention but from different parents and caregivers. In Study 2, parents or caregivers of children who were suspected victims of abuse presenting to a children's hospital forensic unit were randomly assigned to the EBP intervention protocol or typical services. The EBP intervention took place during forensic medical examinations performed for children who were referred for child abuse investigations. During the examination, nurses followed a protocol to educate parents and caregivers about EBPs for child mental health problems, addressing barriers to care and discussing with the parents the logistics of setting up an appointment.

In Study 1, the EBP intervention group included 172 parents or caregivers in both groups (number in each group not specified). In Study 2, the EBP intervention group included 24 parents or caregivers, and the usual-care group included 27 parents or caregivers. Outcomes in both studies included parent/caregiver ratings (1–5, with 5 being *definitely yes* and 1 being *definitely no*) of access to EBT, satisfaction with services, helpfulness of mental health treatment, confidence to set and attend mental health treatment appointments, learning about an EBT, and feelings of being respected. Outcomes were assessed via phone calls with parents 1 month after the examination.

Intermediate Outcomes

Parents or caregivers in the EBP intervention group reported significantly higher ratings than parents or caregivers in the usual-care group for each of the six outcomes assessing access to EBPs, satisfaction with services, helpfulness of mental health treatment, confidence to set and attend mental health treatment appointments, learning about an EBT, and feelings of being respected. Outcomes were assessed via phone calls with parents 1 month after the examination (Table 7). The statistical significance of the findings held for both studies, with the exception that parents' or caregivers' ratings of the helpfulness of mental health treatment did not significantly differ between groups in Study 2 (i.e., the RCT). The patterns of significance held constant across unadjusted and adjusted analyses.

Study authors also collected data on motivation to use the protocol and length of administration time from nurses in the EBP intervention group and combined across both studies. The nurses rated the protocol favorably and reported that the time to use the protocol took a mean of 2.4 minutes longer than it would have taken to address similar issues without the protocol.

Table 7. Training nurses to educate parents about EBPs: Summary of results

Table 1. Training nurses to educate parents about EBT: Summary of Results					
Study Design/Risk of Bias	Study Arms		N Analyzed	Outcome Reported by Study and Time Period	Results
	Differences in Strategy Components Across Study Arms				
Gully et al., 2008 ⁶⁶ Study 1: Cohort design/High	Study 1:		Study 1:	Calculated mean G1–G2 difference in parent report (scale=1–5) of nurse discussing EBT during appointment	0.8 95% CI, 0.30 to 1.30
	G1: Protocol to train nurses to educate parents about EBPs		G1: 86	Calculated mean G1–G2 difference in parent report (scale=1–5) of satisfaction with services	0.4, 95% CI, 0.15 to 0.65
	G2: Typical services		G2: 86	Calculated mean G1–G2 difference in parent report (scale=1–5) of perceived value of services	0.8, 95% CI, 0.52 to 1.08
	All 4 professional components (distribution of educational materials, educational meetings, educational outreach visits, patient-mediated interventions) differed across arms (comparison group strategy contained no components)			Calculated mean G1–G2 difference in parent report (scale=1–5) of confidence in setting/attending child mental health treatment appointments	0.9, 95% CI, 0.58 to 1.22
				Calculated mean G1–G2 difference in parent report (scale=1–5) of knowledge about EBPs	2.4, 95% CI, 2.04 to 2.76
				Calculated mean G1–G2 difference in parent report (scale=1–5) of rapport with the nurse	0.4, 95% CI, 0.15 to 0.65
Gully et al., 2008 ⁶⁶ Study 2: RCT/High	Study 2:		Study 2:	Calculated mean G1–G2 difference in parent report (scale=1–5) of nurse discussing EBT during appointment	1.9, 95% CI, 1.13 to 2.67
	G1: Education of parents and caregivers of children suspected of being abuse victims		G1: 24	Calculated mean G1–G2 difference in parent report (scale=1–5) of satisfaction with services	0.9, 95% CI, 0.36 to 1.44
	G2: Typical services during a forensic medical examination		G2: 27	Calculated mean G1–G2 difference in parent report (scale=1–5) of perceived value of services	0.6, 95% CI, -0.02 to 1.18
	All 4 professional components (distribution of educational materials, educational meetings, educational outreach visits, patient-mediated interventions) differed across arms (comparison group strategy contained no components)			Calculated mean G1–G2 difference in parent report (scale=1–5) of confidence in setting/attending child mental health treatment appointments	2.5, 95% CI, 1.86 to 3.14
				Calculated mean G1–G2 difference in parent report (scale=1–5) of knowledge about EBPs	1.1 95% CI, 0.60 to 1.60
				Calculated mean G1–G2 difference in parent report (scale=1–5) of rapport with the nurse	1.1, 95% CI, -0.49 to 1.69

CI = confidence interval; EBP = evidence-based practice; G = group; N = number; RCT = randomized controlled trial.

Patient Health and Service Utilization Outcomes

The study did not report patient health and service utilization outcomes.^{98, p. 8} The EBPs supporting the strategy included those identified as providing the “greatest level of theoretical, clinical, and empirical support” for abused children and their families: Trauma-Focused Cognitive Behavioral Therapy, Abuse-Focused Cognitive Behavioral Therapy, and Parent-Child Interaction Therapy.⁹⁸

Risk of Bias Considerations

We rated both studies presented in this publication as having high risk of bias. Both studies had high attrition and no adjustment for missing data (48% for Study 1 and 41% for Study 2). In addition, Study 1 had the potential for confounding through nonrandom assignment, because of its cohort design. Study 2 did not report details about randomization, although the authors did conduct post hoc tests and determined that neither variable that significantly differed between groups (age and race/ethnicity) was significantly associated with outcomes. All outcomes were parent or caregiver answers to nonvalidated questions measured on a Likert scale (1–5).

Conclusion and Strength of Evidence

We graded the strength of evidence for a strategy training nurses to educate parents about EBP as low for benefit. The evidence consisted of a single publication presenting data from two studies, a cohort study with a historical control and an RCT, rated as having high risk of bias, but providing consistent, direct, precise results. Specifically, the strategy (comprising educational meetings or materials, education outreach visits, and patient-reported data components) was directed at parents of children suspected to be victims of abuse. It increased access to care, satisfaction, treatment engagement, and therapeutic alliance (Table F-2).

Training Practitioners To Identify and Refer Cases

Study Description

One stratified cluster RCT⁹⁰ (high risk of bias) focused on testing an educational strategy targeting general practitioners (GPs). These GPs had access to early-intervention services for young people ages 14 to 30 with first-episode psychosis in three inner-city primary care trusts in Birmingham, England. Practices in the strategy arm received an educational intervention addressing practitioner knowledge, skills, and attitudes about first-episode psychosis; control practices did not receive the educational intervention but had access to the early-intervention services. The primary outcome was the difference in the proportion of young patients with first-episode psychosis referred to early-intervention services between practices. Secondary outcomes included duration of untreated psychosis, time to recovery (with recovery measured by the Positive and Negative Syndrome Scale), detainment under the Mental Health Act, and GP consultation rate. The authors used nonlinear mixed models to present the relative risk (RR) and 95% CIs for the primary outcome (difference in number of referrals per practice using Poisson error).

A total of 110 of 135 (81%) of eligible practices were recruited between 2004 and 2007 and randomized to the strategy or control arm (n=55 in each). One hundred seventy-nine patients with first-episode psychosis ages 14 to 30 were referred; 25 referred from the early-intervention services, and 54 were found eligible for inclusion during the team's audit of mental health notes. Eighty-three of the 179 patients provided secondary outcomes data (97 from the strategy group and 82 from the control group); a total of 68 of these were followed up 4 months later. Practices were recruited over three time periods, as more early-intervention services opened, allowing more practices to become eligible for study inclusion.

Intermediate Outcomes

The relative risk of referral to early-intervention services (patient access to care) did not significantly differ between strategy and control practices (Table 8).

Table 8. Training practitioners to identify and refer cases: Summary of results

Study Arms				
Study Design/Risk of Bias	Differences in Strategy Components Across Study Arms	N Analyzed	Outcome Reported by Study and Time Period	Results
Lester et al., 2009 ⁹⁰ Stratified cluster RCT/High	G1: Professional training to identify and refer cases	G1: 55 practices (97 patients)	RR for referral to early-intervention services after first contact (patient access to care)	RR: 1.20 95% CI, 0.74 to 1.95 p=0.48
	G2: Usual care	G2: 55 practices (82 patients)	Relative difference in detainment under the Mental Health Act within 4 months	Risk difference: 3.3%, p=0.79
	All professional components (educational meetings, local consensus process, educational outreach visits, marketing) differed across arms (comparison group strategy contained no components)		Duration of untreated psychosis as defined from onset of psychosis through receipt of early-intervention services (mental health symptoms)	Mean difference = -13.8, 95% CI, -199.1 to 171.6, p=0.88
			Delay in reaching early-intervention services as defined from first decision to seek care through 4 months after strategy (health care utilization)	Mean difference = -222.03; 95% CI, -83.5 to -360.5; p=0.002

CI = confidence interval; G = group; N = number; p = p-value; RCT = randomized controlled trial; RR = relative risk.

Patient Health and Service Utilization Outcomes

Several patient health and service utilization outcomes also did not differ between strategy practices and control practices (Table 9): detainment under the Mental Health Act during 4-month followup, recovery at the end of 4-month followup (as defined by a score of less than 10 on the positive subscale of the Positive and Negative Syndrome Scale; 55.3 percent vs. 64.4 percent, p=0.66 for strategy vs. control practices, respectively), number of consultations in primary care (RR, 0.77; 95% CI, 0.45 to 1.33; p=0.34), and mean duration of untreated psychosis as retrospectively assessed at baseline. Patients registered to strategy practices, however, had shorter delays than patients registered to control practices in reaching early-intervention services, as defined by the time from the first decision to seek care to the point of referral to an early-intervention service.

Risk of Bias Considerations

We rated the study as having high risk of bias because of high rates of patient attrition for the secondary outcomes (53.6% attrition for completion of study schedules and 62.0% attrition at 4-month followup). The authors did not use intention-to-treat models or adjust analyses for baseline differences across groups. For example, the randomization did not preclude the overrepresentation of young people from black and ethnic minority communities, but this difference was not accounted for in the analyses.

Conclusion and Strength of Evidence

We rated the evidence on a general professional training strategy to improve the identification and referral of cases of first-episode psychosis in young adults ages 14 to 30 as insufficient for early referral to care (patient access) or mental health symptoms and low for benefit for service utilization (a significant reduction in the duration of untreated psychosis)

(Table F-3). The evidence consisted of a single publication that presented data from a stratified cluster RCT, with high study limitations and imprecise results. The strategy included educational meetings or materials and educational outreach visits components.

Training Practitioners With or Without Feedback To Implement an EBP

Study Description

One cluster RCT study⁸⁸ focused on training school counselors to prevent the development of externalizing disorders among children at high risk for aggression. The investigators trained school counselors to use the Coping Power (CP) program with third-grade children at high risk for aggressive behaviors as they transitioned to middle school. Study investigators randomly assigned counselors to one of three study arms: CP training plus feedback (CP-TF), CP-basic training (CP-BT), or comparison; thus, the two groups' testing strategies differed with respect to training intensity. Study investigators randomly assigned school counselors in 57 public schools to one of the three conditions, resulting in 19 schools per condition: 15 counselors in CP-TF, 17 in CP-BT, and 17 in the comparison group. Teachers nominated at-risk students using a rating scale for aggressive behavior. Investigators excluded the upper 2 percent of aggressive students because they were believed to be likely to have psychiatric diagnoses and were not appropriate for the indicated prevention programs. A total of 1,422 children met inclusion criteria from a screened sample of 3,838 children. The investigators were able to make contact with 670 of these potential participants, and 531 agreed to participate (79%). Sixty-five percent of the screened sample was boys. Eighty-four percent were African Americans, 14 percent were Caucasians, and 2 percent were of other race/ethnicity.

CP-TF provided more intensive training than CP-BT and had four components: (1) school counselors received three initial workshop training days in the fall, (2) school counselors participated in monthly ongoing 2-hour training sessions, (3) the trainers made individualized consultation to the school counselors available by email and telephone, and (4) the trainers reviewed the rate of completion of session objectives and provided individualized supervisory feedback through written and telephone contact on the quality of their intervention implementation to enhance EBP intervention integrity. The feedback involved the trainer reviewing whether intervention objectives were met for each session and discussing the involvement and enthusiasm of the participants, as well as whether the counselors were using appropriate monitoring techniques.⁹⁹ This feedback was viewed as the most important component of the intervention, because prior studies had shown that successful engagement of students and parents in the CP intervention was critical to success, as was maintaining their active involvement and attendance once engaged.⁹⁹ CP-BT did not include feedback but comprised the same first two training components as CP-TF. In the CP-BT group, school counselors received 3 training days in the fall and monthly 2-hour training sessions. Eight variables evaluated concrete aspects of program delivery and counselor engagement in delivering the program. Research assistants coded seven of these measures from audiotapes of child and parent sessions by using the objectives list for CP sessions after each EBP intervention session. Ninety-four percent of the parents and children and 88 percent of teachers in the sample provided assessment data. The authors tested baseline differences between completers and those lost to followup within each of the three groups for each of seven outcomes and found significant differences on 3 of the 21 tests. In the comparison condition, those lost to followup had higher externalizing problems and lower social skills according to parents; conversely, they also had lower expectations that aggression would lead to better outcomes than completers in the

comparison condition. Thus, the authors concluded that there were no clear patterns of differential attrition.

The authors used hierarchical linear modeling (HLM) to evaluate the effects of the strategy on poststrategy assessments of three externalizing behaviors and four positive targeted processes collected from children, caretakers, and/or teachers 2 years after baseline data collection. Intermediate outcomes included implementation outcome comparisons between CP-TF and CP-BT strategy group children. These included, for both children and for parents, number of sessions scheduled and attended, rates of strategy objectives completed, number of contacts with trainers, and ratings of counselors' engagement. Patient health and service utilization outcomes included children's externalizing behavior problems (as rated by teachers, parents, and children), positive social and academic behaviors as rated by parents and teachers, children's outcome expectations for aggressive behavior, and parents' consistency of discipline. Study investigators compared scores for participants in the TF group and BT group with scores of participants in the comparison group.

Intermediate Outcomes

The study did not examine differences in intermediate outcomes between groups. It did, however, present intermediate outcomes for differences between the two strategy groups that differed based on training intensity, which we considered to be relevant to KQ 3. We describe these comparisons below in the KQ 3 section.

Patient Health and Service Utilization Outcomes

The study found that children in the CP-TF group showed larger decreases in teacher-rated externalizing problems and child-rated minor assaults, as well as larger increases in teacher-rated social and academic competence than the control group children at 2-year followup (Table 9). The study reported no significant differences ($p>0.05$) on any of these outcomes between children in the CP-BT group and children in the comparison group.

Risk of Bias Considerations

We rated this study as having unclear risk of bias. The authors did not report details about the randomization method, allocation concealment, blinding of outcome assessors, or fidelity to protocol. Further, the study did not report differences in baseline characteristics between groups so the success of the randomization method is unknown. In addition, analyses only adjusted for clustering within students, clustering between counselors, and baseline levels of each outcome, so any significant differences in characteristics by group membership were uncontrolled. Although attrition was not at a concerning level (6% for parents and 12% for teachers), the authors noted some differences in characteristics between those lost to followup and completers (data not reported). Furthermore, the authors did not use intention-to-treat analyses.

Table 9. Training practitioners with or without feedback to implement an EBP: Summary of results

Study Arms				
Study Design/Risk of Bias	Differences in Strategy Components Across Study Arms	N Analyzed	Outcome Reported by Study and Time Period	Results
Lochman et al., 2009 ⁸⁸ Cluster RCT/Unclear	G1: Professional training plus feedback to implement an EBP intervention (Coping Power: CP-TF)	G1: 168	Behavior problems: beta coefficient, SE, and p-value for externalizing composite (teacher-rated) score change at 2 yrs in HLM analyses adjusted for baseline score, within-student variation, and between-counselor variation	G1 vs. G3: -0.41, SE=0.16, p=0.01
	G2: Professional training only to implement an EBP intervention (Coping Power: CP-BT)	G2: 183	Behavior problems: beta coefficient, SE, and p-value for externalizing composite (parent-rated) score change at 2 yrs in HLM analyses adjusted for baseline score, within-student variation, and between-counselor variation	G2 vs. G3: 0.10, SE=0.16, p=0.52
	G3: Control	G3: 180	Behavior problems: beta coefficient, SE, and p-value for minor assault (child-rated) score change at 2 yrs in HLM analyses adjusted for baseline score, within-student variation, and between-counselor variation	G1 vs. G3: -0.23, SE=0.12, p=0.05
	Training plus feedback arm had 5 professional components (educational materials, educational meetings, audit and feedback, marketing, and one other—monthly ongoing training sessions)		Behavioral problems: beta coefficient, SE, and p-value for minor assault (child-rated) score change at 2 yrs in HLM analyses adjusted for baseline score, within-student variation, and between-counselor variation	G2 vs. G3: -0.13, SE=0.11, p=0.26
	Training-only arm had 2 components (educational meetings and marketing)		Targeted processes: beta coefficient, SE, and p-value for social/academic competence (teacher-rated) score change at 2 yrs in HLM analyses adjusted for baseline score, within-student variation, and between-counselor variation	G1 vs. G3: -0.25, SE=0.12, p=0.03
	Control arm had no components		Targeted processes: beta coefficient, SE, and p-value for social/academic competence (teacher-rated) score change at 2 yrs in HLM analyses adjusted for baseline score, within-student variation, and between-counselor variation	G2 vs. G3: 0.04, SE=0.11, p=0.70
			Targeted processes: beta coefficient, SE, and p-value for social/academic competence (teacher-rated) score change at 2 yrs in HLM analyses adjusted for baseline score, within-student variation, and between-counselor variation	G1 vs. G3: 0.35, SE=0.13, p=0.01
			Targeted processes: beta coefficient, SE, and p-value for social composite (parent-rated) score change at 2 yrs in HLM analyses adjusted for baseline score, within-student variation, and between-counselor variation	G2 vs. G3: 0.24, SE=0.13, p=0.06
			Targeted processes: beta coefficient, SE, and p-value for social composite (parent-rated) score change at 2 yrs in HLM analyses adjusted for baseline score, within-student variation, and between-counselor variation	G1 vs. G3: 0.06, SE=0.12, p=0.65
			Targeted processes: beta coefficient, SE, and p-value for Outcome Expectations Questionnaire (child-rated) score change at 2 yrs in HLM analyses adjusted for baseline score, within-student variation, and between-counselor variation	G2 vs. G3: 0.15, SE=0.12, p=0.21
			Targeted processes: beta coefficient, SE, and p-value for Outcome Expectations Questionnaire (child-rated) score change at 2 yrs in HLM analyses adjusted for baseline score, within-student variation, and between-counselor variation	G1 vs. G3: -0.24, SE=0.12, p=0.05
			Targeted processes: beta coefficient, SE, and p-value for inconsistent discipline (parent-rated) score change at 2 yrs in HLM analyses adjusted for baseline score, within-student variation, and between-counselor variation	G2 vs. G3: 0.05, SE=0.12, p=0.67

CP-BT = Coping Power-Basic Training; CP-TF = Coping Power-Training plus Feedback; EBP = evidence-based practice; G = group; HLM = hierarchical linear modeling; N = number; OR = odds ratio; RCT = randomized controlled trial; RR = relative risk; p = p-value; SE = standard error; yr = year.

Conclusion and Strength of Evidence

We graded the strength of evidence on a strategy training school counselors to prevent the development of externalizing disorders among children at high risk for aggression as low for no benefit for one outcome and low for benefit for another. The evidence consisted of a single

publication that presented data from a cluster RCT with medium study limitations and precise results. Specifically, the strategy included educational meetings and materials and audit and feedback components. The study found no improvements in mental health symptoms but increases in socialization skills and behaviors. This study examined the effect of altering the level of intensity in disseminating a prevention training and feedback program (Table F-4).

Training Practitioners To Use a Patient Medication Monitoring Program

Study Description

One interrupted time-series study (outcomes were averaged across patients before and after the strategy)⁹⁵ evaluated the effect of a strategy to train practitioners to monitor patients on second-generation antipsychotics (SGAs) using a metabolic monitoring training program (MMTP). The MMTP instructed prescribers among the Vancouver Health Child and Youth Mental Teams on best practice in metabolic monitoring and the use of a metabolic monitoring and documentation tool (MMT). The study analyzed four data points before (from September 1, 2007, through December 31, 2008) and four after implementing the MMTP (from January 1, 2009, through April 20, 2010). The sample before MMTP implementation (N=1,114) was evaluated at baseline, 3, 6, and 12 months. The sample after MMTP implementation (N=1,262) was evaluated starting from a baseline measure (immediately after MMTP implementation) and then at 3, 6, and 12 months post-MMTP, using retrospective chart reviews.

Intermediate Outcomes

A chart review revealed that the MMT was in the chart of 38.3 percent of recipients of SGAs after implementation. The study also reported a drop in the prevalence of SGA prescribing from pre-MMTP period to post-MMTP (Table 10).

Table 10. Training practitioners to use an MMTP: Summary of results

Study Design/Risk of Bias	Study Arms		Outcome Reported by Study and Time Period	Results
	Differences in Strategy Components Across Study Arms	N Analyzed		
Ronsley et al., 2012 ⁹⁵ Interrupted time series-retrospective chart review/Unclear	G1: 1,262 post-MMTP patients G2: 1,114 pre-MMTP patients All professional components (educational materials, educational meetings, educational outreach visits, reminders, and one other—online access and project coordinator) differed across study arms (comparison group strategy contained no components)	G1: Patient MMTP for practitioners G2: Usual care	Proportion with SGA prescription Timing unclear	G1: 172/1,114 (15.4%) G2: 81/1,262 (6.4%) Calculated OR: 0.376; 95% CI: 0.284 to 0.496, p<0.001

CI = confidence interval; G = group; MMTP = Metabolic Monitoring Training Program; N = number; OR = odds ratio; p = p-value; SGA = second-generation antipsychotic.

Patient Health and Service Utilization Outcomes

For SGA-treated patients, the authors also reported monitoring rates pre- and postimplementation for anthropometric measures (height, weight, waist circumference, and blood pressure) and blood work parameters (fasting glucose, insulin, total cholesterol, triglycerides, high-density lipoprotein cholesterol or low-density lipoprotein cholesterol alanine aminotransferase or aspartate aminotransferase, prolactin). The authors reported that all measures were statistically significantly between pre-MMTP and post-MMTP measures at baseline, at 3 and 6 months, but not at 12 months. Our calculated OR, however, based on overall reported Ns (Appendix E) suggests a decline in OR over time for some but not all measures. Nearly all measures continue to have statistically significant effects over time.

Risk of Bias Considerations

The study did not report many key details pertaining to design and conduct. For example, we could not ascertain the proportion of patients that were retained in the sample before and after MMTP. A key concern for time-series and other types of ecological or aggregate studies relates to unmeasured concomitant strategies or secular changes. The rates of metabolic monitoring declined over time in both the pre-MMTP and the post-MMTP period. The authors did not comment on reasons for a decline in the pre-MMTP period, but in the absence of an active strategy during this phase, it is unclear whether concomitant external changes explain the pre-MMTP trend toward lower monitoring. Without further information on the reasons for the decline over time in monitoring before program implementation, the large differences between the pre-MMTP period and the post-MMTP period cannot be confidently attributed to the strategy alone. As a result, we rated this study as having unclear risk of bias.

Conclusion and Strength of Evidence

We graded the strength of evidence for a strategy training practitioners to use medication monitoring as low for benefit. The evidence consisted of one observational single study with high risk of study limitations and precise results. The strategy included educational meetings or materials, educational outreach visits, and reminders. Specifically, the study found that establishing an MMTP increases practitioner adherence and appropriate service utilization (Table F-5).

Adding Computer-Assisted Training With or Without Ongoing Supervision and Coaching to Practitioners Implementing an EBP

Study Description

One cluster RCT⁹¹ evaluated practitioner training strategies with increasing intensity to implement contingency management (CM) in community mental health centers that serve youth with substance use disorders. CM techniques provide concrete rewards for behaviors incompatible with substance use. The study tested the strategies by randomizing 161 therapists from 10 agencies to one of three training groups: (1) a workshop (WSR) enhanced with access to resources needed to implement CM such as worksheets, therapist scripts, and urine drug screens; (2) WSR plus computer-assisted training (CAT) for 6 months following the workshop (WSR+CAT); and (3) WSR+CAT and ongoing supervision and coaching that included site visits, booster trainings, and biweekly telephone consultations between CM experts and supervisors for 12 months following the workshop (WSR+CAT+SS).

Outcome measures included measures of therapist CM use (the proportion of patients treated for substance use disorders treated with CM), knowledge via the CM Knowledge Test to assess changes in CM knowledge (scaled range 0–100), and adherence via cognitive behavioral (range 0–19) and monitoring subscales (range 0–15) from a revised CM-Therapist Adherence Measure (TAM) measure collected from therapists at baseline and every 2 months for 1 year after baseline. The authors used HLM to analyze the data.

Intermediate Outcomes

Therapists in each group (WSR, WSR+CAT, and WSR+CAT+SS) had significant improvements in CM use, knowledge, cognitive behavioral adherence, and monitoring adherence, but there were no significant differences in improvement among groups (Table 11). The authors reported that differences were not significant and significance could not be calculated from raw data given clustering of data.

Table 11. Adding computer-assisted training with or without ongoing supervision and coaching to practitioners implementing an EBP: Summary of results

Study Design/Risk of Bias	Study Arms Differences in Strategy Components Across Study Arms	N Analyzed	Outcome Reported by Study and Time Period	Results
Henggeler et al., 2013 ⁹¹ Cluster RCT/Unclear bias	G1: Workshop enhanced with ongoing access to CM implementation resources (WSR) G2: WSR plus CAT for 6 months following workshop (WSR+CAT) G3: WSR+CAT plus ongoing support from a CM expert for 12 months following workshop (WSR+CAT+SS) Two components (both professional components—intensity of educational materials and educational outreach visits) differed across study arms (only WSR+CAT+SS had educational outreach visits, and additional educational materials were included in WSR+CAT and WSR+CAT+SS groups)	G1: 52 G2: 53 G3: 56	Therapist reported CM use	All groups significantly improved during 12-month followup, but no significant differences in improvement among the groups
			Therapist reported CM knowledge	All groups significantly improved during 12-month followup, but no significant differences in improvement among the groups

Table 11. Adding computer-assisted training with or without ongoing supervision and coaching to practitioners implementing an EBP intervention: Summary of results (continued)

Study Design/Risk of Bias	Study Arms Differences in Strategy Components Across Study Arms	N Analyzed	Outcome Reported by Study and Time Period	Results
			Therapist reported CM adherence (cognitive behavioral subscale)	All groups significantly improved during 12-month followup, but no significant differences in improvement among the groups
			Therapist reported CM adherence (monitoring subscale)	All groups significantly improved during 12-month followup, but no significant differences in improvement among the groups

CM = contingency management; EBP = evidence-based practice; G = group; N= number; RCT = randomized clinical trial; WSR = workshop plus resources; WSR+CAT = workshop plus resources plus computer-assisted training; WSR+CAT+SS = workshop plus resources plus computer-assisted training plus supervisory support.

Patient Health and Service Utilization Outcomes

Neither study reported patient health and service utilization outcomes, but the first study cited an earlier study for evidence of effectiveness of CM for improving youth substance abuse outcomes.¹⁰⁰

Risk of Bias Considerations

The study provided insufficient information to judge risk of bias on most criteria. Although the authors note randomization at the level of public-sector provider organizations (N=10), the authors did not provide enough information to judge whether the study was fully randomized. For example, they offered no details on sequence generation or allocation concealment. Other unclear aspects of study design and conduct include validity of inclusion and exclusion criteria, blinding of outcome assessors, fidelity of the intervention, potentially concurrent interventions, attrition rate, and potential for crossover or contamination.

Conclusion and Strength of Evidence

We graded the strength of evidence of a strategy adding computer-assisted training to practitioners implementing an EBP as insufficient for practitioner use, knowledge, and adherence competence/skills (Table F-6). No information was provided on patient health and service utilization outcomes. The evidence consisted of one trial with medium study limitations and imprecise results arising from small sample sizes. Specifically, the strategy tested increasingly intensive practitioner training strategies to implement CM as compared with the group with lowest intensity, workshop plus resources.

Financial or Organizational Change Strategies

Ten studies reported in 11 publications focused on changing systems of care.^{13,14,67,68,84-86,89,92-94} These studies each included at least one financial or organizational component according to the EPOC taxonomy. These components included provider incentives (a financial component); clinical multidisciplinary teams and strategies to “boost morale” by facilitating conditions to improve provider satisfaction with conditions of their work (organizational provider components); and/or quality monitoring, staff organization, and enhanced referral and choice of treatment (organizational structural components). The target of these strategies ranged

from primary care clinicians or pediatricians (n=3) to community-based mental health therapists (n=3 with outcomes reported in 4 studies) or substance use providers (n=1) and practitioners in private, for-profit behavioral health organizations providing home-based treatment (n=1), practices (n=1), and organizations (n=1). These studies ultimately targeted patients with attention deficit hyperactivity disorder (ADHD) (n=3), externalizing problems (n=2), substance use problems (n=3), and general mental health problems (n=2 with outcomes reported in 3 studies). We provide further details for each strategy below.

Providing Practitioner Access to Practice Guidelines Via an Internet Portal

Study Description

One cluster RCT⁸⁵ examined the impact of an ADHD assessment and medication management program, facilitated through an Internet platform to pediatricians in primary care practices. The authors reported that the program was based on the evidence base for the American Academy of Pediatrics guideline recommendations. The trial included 511 children and 49 pediatricians spread across 8 practices. Each matched practice pair (created according to the number of pediatricians and percentage of patients with Medicaid) was randomly allocated to either the strategy group (n=4 practices) or the control group (n=4 practices). The strategy group received the strategy immediately, while the control group received it after 6 months. Intervention practices participated in four 1-hour sessions of training on the new system, including didactic lectures and office flow modification workshops. Practices were then given access to an ADHD Internet portal that allowed parents, teachers, and pediatricians to input information (e.g., rating scales) about patients, after which information was scored, interpreted, and formatted in a report style that was helpful for assessing and treating patients with ADHD. Physicians evaluated their practice behaviors quarterly and addressed underperforming areas. Investigators conducted chart reviews at baseline and at 6-month followup for evidence of documentation of 5 guideline-specific measures. Investigators compared the percentage change in patients for whom each physician used each guideline behavior between baseline and followup between the strategy and control group using intent-to-treat analysis using t-tests. They did not account for clustering, given the small number of practices (n=8). They did not report differences in baseline levels of each outcome.

Intermediate Outcomes

The study compared several practitioner adherence and model program fidelity outcomes across study arms. Physicians in the strategy group had a higher mean change in the proportion of using parent ratings for assessment than physicians in the control group, the proportion using teacher ratings for assessment, and the proportion using *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* (DSM-IV) ADHD criteria during assessment (Table 12). Pediatricians in the strategy group had greater decreases in the change in the proportion of using outside practitioners for ADHD diagnosis and in the proportion using teacher ratings to monitor treatment responses. The difference in the proportion of pediatricians using parent ratings to monitor treatment responses between the strategy and control group did not reach significance.

Patient Health and Service Utilization Outcomes

The study did not report any final health or utilization outcomes. The strategy used an EBP (clinical practice guidelines set forth by the American Academy of Pediatrics).^{101,102}

Table 12. Providing practitioner access to practice guidelines via an Internet portal: Summary of results

Study Design/Risk of Bias	Study Arms		Outcome Reported by Study and Time Period	Results
	Differences in Strategy Components Across Study Arms	N Analyzed		
Epstein et al., 2011 ⁸⁵ /Cluster RCT/Unclear	G1: Internet portal providing practitioner access to practice guidelines	G1: 4 practices, 27 pediatricians, 501 patients	Difference in mean baseline to 6-month followup change in proportion of practitioners using parent ADHD ratings during assessment	18.1, 95% CI, 2.05 to 34.2
	G2: Wait-list control	G2: 4 practices, 22 pediatricians, 245 patients	Difference in mean baseline to 6-month followup change in proportion of practitioners using teacher ADHD ratings during assessment	16.6, 95% CI, 1.61 to 31.6
	All components (5 professional components—distribution of educational materials, educational meetings, patient-mediated interventions, audit and feedback, and reminders; 1 financial component—provider incentives; 2 organizational provider-oriented components—clinical multidisciplinary teams) differed across study arms (comparison group strategy contained no components)		Difference in mean baseline to 6-month followup change in proportion of practitioners using DSM-IV criteria during assessment	29.4, 95% CI, 5.98 to 52.8
			Difference in mean baseline to 6-month followup change in proportion of practitioners using an outside practitioner for ADHD diagnosis	-50.0, 95% CI, -70.5 to -29.5
			Difference in mean baseline to 6-month followup change in proportion of practitioners using parent ratings of ADHD to monitor treatment responses	23.2, 95% CI, -1.78 to 48.2
			Difference in mean baseline to 6-month followup change in proportion of practitioners using teacher ratings to monitor treatment responses	32.4, 95% CI, 12.1 to 52.7

ADHD = attention deficit hyperactivity disorder; CI = confidence interval; DSM-IV = *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition*; G = group; N = number; RCT = randomized controlled trial.

Risk of Bias Considerations

We rated this study as having unclear risk of bias. The eight participating practices were matched according to number of pediatricians in the practice and the percentage of children on Medicaid; however, the study did not clarify whether other important differences existed in the practitioners or the patients between these practices. In addition, the study did not clarify whether patients were blinded to the strategy or whether outcome assessors were blinded to the outcome status of participants. The trial reported insufficient information to judge risk of bias on some criteria. For example, differences in baseline characteristics between groups are not reported. An

RCT is likely to have few differences between groups, but we could not assess the success of the randomization in this study.

Conclusion and Strength of Evidence

We graded the strength of evidence on a strategy providing pediatricians with access to ADHD guidelines through an Internet portal as low for benefit. The evidence consisted of a single-cluster RCT, with medium study limitations and imprecise results (Table F-7). The strategy included educational meetings or materials, patient-reported data, audit and feedback, reminders, and quality monitoring. Specifically, the study yielded low strength of evidence for intermediate outcomes of practitioner protocol adherence and program model fidelity. The Internet portal has since been adopted in a range of settings.¹⁰³ A case study found that physicians' interest in adoption stemmed from the desire to improve ADHD care and to earn continuing medical education credits.

Adding Weekly Feedback to Practitioners Regarding Patient Symptoms and Functioning

Study Description

One cluster RCT¹³ evaluated the addition of weekly feedback of patient mental health symptoms and functioning as rated by youths, caregivers, and clinicians to therapists (the Contextualized Feedback System [CFS]) in addition to standard 90-day feedback. The study hypothesized that this weekly feedback addition would improve mental health treatment effectiveness in a private mental health treatment organization. Clinicians in the control group received only the 90-day feedback. The trial initially randomized 24 sites to the group receiving the additional weekly feedback and 25 sites to the comparison group. Over 40 percent of the sites (21 sites in total, 11 experimental, 10 control) dropped out of the study. The Symptoms and Functioning Severity Scale (SFSS, range 1-5) was scheduled to be completed every 2 weeks, but at least one measure in the battery was scheduled to be collected every week. The actual rate of data collection was lower than planned (mean records per youth: 11 ± 9.2 ; mean number of weeks participated: 16.5 ± 13.6), resulting in 1,341 SFSS scales from 340 youths, 1,291 SFSS scales from 144 clinicians, and 935 SFSS scales from 383 caregivers.

Intermediate Outcomes

Although the study did not specify an intermediate outcome, it reported results pertaining to practitioner adherence (Table 13). Specifically, at the onset of the study, the trial was intended to be a 2X2 factorial design with the two feedback groups described above and the presence or absence of three Web-based modules (on therapeutic alliance, expectations about counseling, and collaborative treatment planning). The study reported that only 31 (the authors note that $N=31$ was one-third of the sample but do not specify the denominator) practitioners accessed the Web-based module before their first client, indicating failure of practitioner adherence to the Web-based modules. Study authors then analyzed data by the feedback condition (weekly plus cumulative feedback vs. cumulative feedback only). The authors reported no statistical differences in reasons for attrition between experimental and control groups but provided no additional details.

Table 13. Adding weekly feedback to practitioners regarding patient symptoms and functioning: Summary of results

Study Design/Risk of Bias	Study Arms		Outcome Reported by Study and Time Period	Results
	Differences in Strategy Components Across Study Arms	N Analyzed		
Bickman et al., 2011 ¹³ Cluster RCT/High	G1: Weekly and cumulative 90-day feedback of patient symptoms and functioning (CFS) to practitioners G2: Cumulative 90-day feedback only of patient symptoms and functioning (CFS) to practitioners	G1: 13 sites, 167 youths, 169 caregivers, 64 clinicians	Youth-reported functional severity Estimated coefficient of membership in feedback group at baseline	0.02, SE: 0.10, p>0.005
		G2: 15 sites, 173 youths, 214 caregivers, 80 clinicians	Estimated coefficient of slope (time in weeks) Estimated coefficient of interaction of membership in feedback group and slope	-0.001, SE: 0.002, p<0.0001 -0.01, SE: 0.002, p<0.001
		Total scales analyzed (breakdown by trial arm NR): youth, N=1,341; clinicians, N=1,291; caregivers, N=935	Clinicians-reported functional severity Estimated coefficient of membership in feedback group at baseline Estimated coefficient of slope (time in weeks) Estimated coefficient of interaction of membership in feedback group and slope	0.10, SE: 0.10, p>0.005 -0.005, SE: 0.001, p<0.0001 -0.01, SE: 0.002, p<0.0001
	Single difference in the presence of the organizational structural component, frequency of quality monitoring across arms		Caregivers-reported functional severity Estimated coefficient of membership in feedback group at baseline Estimated coefficient of slope (time in weeks) Estimated coefficient of interaction of membership in feedback group and slope	0.01, SE: 0.13, p>0.005 -0.003, SE: 0.002, p>0.05 -0.01, SE: 0.003, p<0.0001

CFS = Contextualized Feedback System; G = group; N = number; NR = not reported; p = p-value; RCT = randomized controlled trial; SE = standard error.

Patient Health and Service Utilization Outcomes

The authors conducted an HLM that nested repeated measures within participants, youths within clinicians, and clinicians within sites. They estimated three HLMs for each respondent type. The models accounted for repeated measures at unequal durations within and across respondents using restricted maximum likelihood estimation and baseline differences by race through inclusion of race in the model. The study reported no difference at baseline in SFSS between groups (Table F-8). Over time (the slope coefficient in the model), youths and clinicians reported significant improvement in SFSS scores, but caregivers did not. All three groups reported a higher rate of change in improvement in SFSS in the experimental group as calculated by study authors using the HLM-estimated coefficients measured at the average length of presence in the CFS.

Risk of Bias Considerations

As noted above, 21 of 49 sites dropped out of the study after randomization, increasing the potential for high risk of bias. The authors noted that they conducted intention-to-treat analysis but did not specify whether their analysis pertained to all randomized sites or all patients within randomized sites. Although the authors noted no statistically significant differences for attrition, they did not provide details to judge these differences. Additionally, the publication did not provide key details on study design and conduct such as blinding of patients and outcome assessors, method of randomization, allocation concealment, fidelity to protocol, and timing of outcome measurement. Thus, we rated this study as having high risk of bias.

Conclusion and Strength of Evidence

We graded the strength of evidence on a strategy to add weekly feedback to practitioners regarding patient symptoms and functioning as insufficient for clinician adherence and low for functional severity (Table F-8). The evidence consisted of one study with a high risk of study limitations and lack of contextual details for poor clinician adherence. The strategy consisted of quality monitoring (and organizational structural component). Although measurement feedback systems like the CFS potentially hold promise in improving clinical and organizational learning, little is known about how therapists use the feedback and when they should use it.¹⁰⁴ An attempt to widely implement a second generation of the CFS (called Contextualized Feedback and Intervention and Treatment) was not eligible for this review because the study design did not permit us to disentangle the effect of the intervention from its implementation.¹⁰⁵ The study noted substantial differences in implementation. In one site, the modal implementation score was zero, meaning no respondents completed the questionnaire or no clinician reviewed any feedback reports), suggesting substantial implementation challenges. In the other site, the modal score was above 50 (e.g., respondents completed forms half the time, clinicians viewed the forms half the time). The authors note differences between the sites in the way the feedback was collected (paper vs. electronic forms) and the nature of the supervision, suggesting that even in RCTs of complex systems interventions, factors outside the intervention components in the protocol can influence success and failure.

Adding Diagnosis and Treatment Guidelines to a Computer Decision Support System

Study Description

One cluster RCT⁸⁹ evaluated the enhancement of a computer decision support system to improve the quality of ADHD diagnosis and treatment patterns, across 4 clinics and 84 patients (2 clinics and 42 patients per group). The strategy group used a previously studied intervention, Child Health Improvement through Computer Automation, with ADHD guidelines embedded in the computer decision support system. The comparison group used this intervention without embedded ADHD guidelines. In addition to adherence to ADHD guidelines before and after the strategy, the study evaluated changes in prescriber behavior and skills, including changes in medication-prescribing patterns and mental health referral rates.

Intermediate Outcomes

The study reported several measures of improvements in practitioner adherence to using guideline-based care (Table 14). Children in the computer decision support arm were more likely to have been assessed using formal diagnostic tools than children in the control arm. The authors

also reported higher but not statistically significant differences in medication-prescribing patterns, reassessment of symptoms, or mental health referral rates. They noted that the study was underpowered to measure those outcomes. The authors reported a significant increase in the number of reported ADHD symptoms at the time of diagnosis in three out of four symptom domains.

Table 14. Adding diagnosis and treatment guidelines to a computer decision support system: Summary of results

Study Design/Risk of Bias	Study Arms		Outcome Reported by Study and Time Period	Results
	Differences in Strategy Components Across Study Arms	N Analyzed		
Carroll et al., 2013 ⁸⁹ Cluster RCT/Unclear	G1: Computer decision support plus EHR that included diagnosis and treatment guidelines	G1: 2 practices (42 patients)	Use of formal diagnostic assessment	Adjusted OR, 8.0; 95% CI, 1.6 to 40.6 p-value not reported
	G2: Computer decision support plus EHR without diagnosis and treatment guidelines.	G2: 2 practices (42 patients)		Adjusted for age, gender, race/ethnicity, and insurance
	All components (2 professional components—patient-mediated intervention and reminders specific to ADHD and 1 organizational structural component—quality monitoring specific to ADHD) differed across study arms (comparison group strategy contained no components)		Number of core ADHD symptoms noted at baseline (<i>exact N and SD of symptoms not reported by authors</i>)	Estimated mean difference G2-G1: Inattentive symptom (home): -2.1, reported p<0.05 Inattentive (school): -0.9 reported p<0.05 Hyperactive (home): -2.2 reported p<0.05 Hyperactive (school): -1.2 reported p=0.075
			Documented medication adjustments	G1=45% G2=33% Calculated OR, 1.652; 95% CI, 0.683 to 3.998; p=0.266; reported p=0.45
			Reassessment of symptoms at followup visit	G1=50% G2=33% Calculated OR, 2.00; 95% CI, 0.829 to 4.838; p=0.123, reported p=0.36
			Mental health referral	G1=74% G2=55% Calculated OR, 2.323; 95% CI, 0.928 to 5.817; p=0.072, reported p=0.09
			Mental health visit	G1=67% G2=48% Calculated OR, 2.195; 95% CI, 0.909 to 5.303; p=0.081, reported p=0.054

ADHD = attention deficit hyperactivity disorder; CI = confidence interval; EHR = electronic health record; G = group; N = number; OR = odds ratio; p = p-value; RCT = randomized controlled trial; SD = standard deviation.

Patient Health and Service Utilization Outcomes

Based on reported study data, we calculated wide and overlapping CIs for improvement in visits to mental health specialists in the strategy arm when compared with the control arm (Table 15).

Risk of Bias Considerations

Some details pertaining to study design and conduct were not reported, such as randomization approach and allocation concealment, baseline differences in clinics, blinding of outcome assessors, and fidelity to the protocol, leading to an unclear risk of bias.

Conclusion and Strength of Evidence

We graded the strength of evidence on a strategy to add diagnosis and treatment guidelines to a computer decision support system as low for practitioner uptake of guidelines for diagnostic assessment and for practitioner skills in measuring ADHD symptoms at diagnosis and insufficient for practitioner competence (specifically on reassessment of symptoms at 3 months, adjustment of medications, mental health referral) and for service utilization (visits to mental health specialist) (Table F-9). The evidence consisted of one cluster RCT with medium study limitations, imprecise results with a small number of events, and a large magnitude of effect. The strategy included two professional components, patient-mediated intervention and reminders, and one organizational structural component, quality monitoring.

Adding Intensive Quality Assurance To Implement an EBP

Study Description

One CCT,⁹³ with arms assigned at the therapist level, evaluated different ways of integrating an evidence-based intervention (CM) into an existing treatment (multisystemic therapy [MST]) for adolescent marijuana abuse employed in community settings. The study tested the use of Intensive Quality Assurance (IQA) to promote therapist implementation of CM techniques in a community mental health center setting. CM techniques provide concrete rewards for behaviors incompatible with substance use. All practitioners selected for inclusion in the study had already adopted and implemented an EBP (MST) to ensure that they had experience with implementing new treatments in the past and were amenable to such change.

During the 5-month baseline period, the practitioners could access CM financial resources to facilitate MST treatment goals (the current treatment they used) but had not yet received CM protocol training. At the conclusion of the baseline period, practitioners received CM training materials and attended a 2-day CM workshop. Following the workshop, researchers randomized five supervisors and their eight teams (i.e., some supervisors had multiple teams and in that instance, teams with the same supervisor were randomized to the same condition) to IQA or workshop-only (WSO) groups. During the 4-month postworkshop period and the following 6-month sustainability period, all practitioners continued to have access to the CM financial resources. In addition, the IQA group received weekly expert case consultation on CM cases, incorporated feedback on how to improve CM skills and competencies into their existing clinician development plans, and received quarterly booster training. The WSO group clinicians received phone and email access to a CM expert for consultation upon request during the postworkshop period. Both IQA and control group practitioners could access \$150 for each patient to facilitate treatment goals; however, while those in the control group could use these funds to facilitate any aspect of treatment, including but not limited to CM interventions,

practitioners in the IQA group were restricted to using these funds only for the CM voucher system that rewarded patients for clean drug screens.

Analyses included data from 18 practitioners in the IQA group and 12 in the WSO group. The study conducted complex analyses of linear and quadratic trajectories of change over time in ratings of therapist adherence, using youth and caregiver ratings on the CM Therapist Adherence Measure. This measure included five items on a 4-point scale to measure CBT techniques and four items on a 3-point scale to measure monitoring techniques. These items were measured on monthly intervals from each family, leading to clustering within clinicians. The analysis used HLM to account for this clustering. Because the study reported only gamma values from these analyses and did not provide sufficient additional information to provide context, our interpretation of their results is limited to the study's reported p-values.

Intermediate Outcomes

The study reported several measures of practitioner adherence and program fidelity. IQA was more effective than control at increasing practitioner implementation of CM cognitive behavioral techniques in the short term, based on youth and caregiver reports (Table 15). The study also reported (in text) that, based on youth reports, the effect of IQA was sustained. However, based on reported p-values and the discussion in the study, these increases did not appear to be sustained at 6 months for both youth and caregiver reports. The study reported no difference by arm for practitioner implementation of CM monitoring techniques at 4 months and did not conduct further analyses at 6 months.

Table 15. Adding IQA to implement an EBP: Summary of results

Study Design/Risk of Bias	Study Arms Differences in Strategy Components Across Study Arms	N Analyzed	Outcome Reported by Study and Time Period	Results
Henggeler et al., 2008 ⁹³ CCT/Unclear	G1: IQA system to implement an EBP intervention (CM)	G1: 18 G2: 12	Gamma for youth report of therapist use of CM through 4 months postworkshop	Gamma =0.78, SE=0.36, p=0.04
	G2: Workshop only to implement an EBP intervention (CM)		Gamma for youth report of therapist use of CM in the following 6-month sustainability period	Gamma =0.12, SE=0.14, p=NS, details NR
	Two components (a financial patient component—patient incentives and an organizational structural component—quality monitoring) differed across study arms (comparison group strategy contained no components)		Gamma for youth report of clinician use of CM monitoring at 4 months	Gamma =0.03, SE=0.04, p=NS (these are single-arm results, between-group differences not reported)
			Gamma for caregiver report of clinician use of CM monitoring at 4 months	Gamma =0.09, SE=0.10, p=NS (these are single-arm results, between-group differences not reported)
			Gamma for caregiver report of clinician use of CM at 4 months postworkshop	Gamma =0.79 , SE=0.30, p=0.01 linear Gamma=0.18, SE=0.09, p=0.04 quadratic
			Gamma for caregiver report of clinician use of CM 4 months postworkshop	Gamma=0.05, SE=0.54, p=NS

CCT = controlled clinical trial; CM = contingency management; EBP = evidence-based practice; G = group; IQA = Intensive Quality Assurance; N = number; NR = not reported; NS = not significant; SE = standard error.

Patient Health and Service Utilization Outcomes

The study did not report any patient health and service utilization outcomes but cited an earlier study for evidence of effectiveness of CM for improving youth substance abuse outcomes.¹⁰⁰

Risk of Bias Considerations

The study provided insufficient information to judge risk of bias on most criteria. Although the authors note randomization at the level of the supervisor (N=5) and their teams (N=8), they did not provide enough information to judge whether the study was fully randomized. For example, they offered no details on sequence generation or allocation concealment. They noted that they replaced therapists who left the program within a month, leaving unanswered the question of whether or how the new therapists were trained. Other unclear aspects of study design and conduct include validity of inclusion and exclusion criteria, blinding of outcome assessors, fidelity of the intervention, potentially concurrent interventions, attrition rate, and potential for crossover or contamination.

Conclusion and Strength of Evidence

We graded the strength of evidence on a strategy testing an IQA approach to implementing CM vs. a workshop only as insufficient for practitioner adherence and fidelity (Table F-10). The study provided no information on patient health and service utilization outcomes. The evidence consisted of one trial, with unclear risk of bias, high study limitations, and imprecise results. Specifically, the strategy, using a quality monitoring component, found insufficient evidence

Collaborative Consultation To Promote the Use of Titration Trials and Periodic Monitoring During Medication Management

Study Description

One study⁸⁶ examined the use of a collaborative consultative model to improve the use of titration trials and medication monitoring during medication maintenance for children with ADHD. In this model, mental health experts collect behavioral assessment information from the pediatrician during assessment, a titration trial of medication, or medication maintenance and provided feedback to help guide diagnostic and treatment decisions.

The study randomized by clusters, specifically, by practice. Twelve pediatric practice groups that did not have an on-site psychiatrist or psychologist and did have computerized billing systems were randomized to collaborative consultation (6 practices, 25 pediatricians recruited but data available on 16 pediatricians who saw 59 patients) and control groups (6 practices, 27 pediatricians recruited but data available on 22 pediatricians who saw 87 patients). The study collected outcome data on all patients of enrolled practitioners during the followup period in grades 1 through 5 who presented with an ADHD-related problem but had never been on a stimulant to treat ADHD to collect patient-level outcome data.

Pediatricians in the collaborative consultative service group learned how to use titration trials (to determine optimal dosage) and rating scales (to monitor medication efficacy and side effects during medication maintenance) for all eligible children for whom they elected to prescribe medication to treat ADHD. Control group practitioners did not receive collaborative consultative services and provided children usual care.

Nine pediatricians in the strategy group and five in the control group did not enroll any children. Although the study authors initially conducted HLM analyses, the variance components

associated with the pediatric office and individual pediatrician were negligible (variance not reported) and were therefore dropped from all further analyses.

Intermediate Outcomes

Two measures of practitioner adherence/program model fidelity (measured before and after the intervention via practitioner surveys) were compared between study arms. More pediatricians in the strategy group used titration trials than in the control group (Table 16). Both groups improved medication monitoring over time, but the study reported that monitoring did not increase more among pediatricians in the strategy group than in the control group (details not reported).

The study collected one measure of practitioner competence/skills. Our calculated OR for differences in the proportion of pediatricians citing specific obstacles preventing the implementation of evidence-based treatments found lower odds in the strategy arm for all outcomes. These ORs were statistically significant for the cited obstacles of lack of access to medications and lack of time for titration trials only (Appendix E).

Table 16. Collaborative consultation to promote the use of titration trials and periodic monitoring during medication management: Summary of results

Study Design/Risk of Bias	Study Arms		Outcome Reported by Study and Time Period	Results
	Differences in Strategy Components Across Study Arms	N Analyzed		
Epstein et al., 2007 ⁸⁶ Cluster RCT/High	G1: Consultative collaborative treatment service to promote the use of titration trials and periodic monitoring during medication management	G1 (pediatricians): 16 G2 (pediatricians): 22	Use of titration trials, a practitioner adherence measure (interaction term from multivariate analysis)	Interaction of group effect and time $\beta = -0.283$, SE, 0.09; $p < 0.01$
	G2: Control		Use of medication monitoring (a measure of practitioner adherence)	Time $\beta = 0.200$; $p < 0.01$, interaction of group and time β NR, but strategy group noted as not having greater increase
	Two components (a professional component—audit and feedback and an organizational provider-oriented component—clinical multidisciplinary systems) differed across study arms (comparison group strategy contained no components)		Cited obstacles to implementation of EBPs (a measure of practitioner competence)	Lower odds with overlapping confidence intervals of citing obstacles in 6 of 8 measures (2 reach statistical significance)
	G1: Consultative collaborative treatment service to promote the use of titration trials and periodic monitoring during medication management	G1 (patients): 59 G2 (patients): 87	Mean scores for combined parent and teacher ratings of ADHD symptoms NR	$F_{1,144} = 0.05$, $p = 0.83$
	G2: Control		F score (test statistic for ANOVA comparison of means across groups) for main effect of combined parent and teacher ratings of ADHD symptoms difference between groups at 12 months	
	Two components (a professional component—audit and feedback and an organizational provider-oriented component—			

Table 16. Collaborative consultation to promote the use of titration trials and periodic monitoring during medication management: Summary of results (continued)

Study Design/Risk of Bias	Study Arms		Outcome Reported by Study and Time Period	Results
	Differences in Strategy Components Across Study Arms	N Analyzed		
	clinical multidisciplinary systems) differed across study arms (comparison group strategy contained no components)		Mean scores for combined parent and teacher ratings of ADHD symptoms NR F score (test statistic for ANOVA) for decrease in combined parent and teacher ratings of ADHD symptoms, group x time interaction	$F_{2,144}=.44, p=0.65$

ADHD = attention deficit hyperactivity disorder; G = group; N = number; NR = not reported; p = p-value; RCT = randomized controlled trial.

Patient Health and Service Utilization Outcomes

ADHD scores for children, as rated by parents and teachers (combined in a single analysis), did not differ by group.

Risk of Bias Considerations

The study experienced substantial practitioner and patient attrition. For practitioners, the differential rate of engagement was 17.5 percent; 5 of 27 pediatricians in the control group and 9 of 25 in the strategy group did not enroll any children in the study. The study did not offer explanations for differences in the rate of engagement. For patients, of 146 participants selected for followup, 45 had data from all 3 data points. The remaining 101 participants had at least 1 missing data point. The authors used a missing-at-random analysis because their analysis found no differences in DSM-IV–defined ADHD symptomatology at baseline between children with missing data and those who had complete data. Nonetheless, the risk of bias from low practitioner engagement and missing patient data put the study at high risk of bias.

Conclusion and Strength of Evidence

We graded the strength of evidence for a collaborative consultation strategy used to promote the use of titration trials and periodic monitoring during medication management as insufficient for practitioner adherence, practitioner competency (cited obstacles to implementing EBPs), or ADHD symptoms. The evidence consisted of one cluster RCT with high study limitations and imprecise results due to small sample sizes. The strategy included audit and feedback and the use of a multidisciplinary team (Table F-11).

Paying Practitioners for Performance in Successfully Delivering an EBP

Study Description

One study⁸⁴ studied a pay-for-performance (P4P) strategy (medium risk of bias) to improve treatment implementation for adolescent substance use disorders. This cluster randomized trial evaluated the use of a P4P initiative among 986 adolescent patients treated by 120 therapists working in 29 different community-based substance use disorder treatment organizations.

Organizations were randomized to an implementation-as-usual (IAU) control condition or to a P4P experimental condition. Therapists across all organizations delivered the same evidence-based treatment using the Adolescent Community Reinforcement Approach (A-CRA), and each organization received standardized funding, training, and coaching from the treatment developers. Therapists in the P4P condition received \$50 each month that they demonstrated competence in A-CRA treatment delivery and \$200 for each patient who received a specified number of treatment procedures and sessions previously determined to be associated with improved patient outcomes. A therapist-level and patient-level propensity score were used to adjust for biases due to the cluster randomized design (i.e., therapists clustered within organizations and patients clustered within therapists). Adjusted intent-to-treat regression models were used to model two implementation outcomes: (1) number of therapists meeting A-CRA competence (using a Poisson distribution) and (2) whether each patient met target A-CRA (using a Bernoulli distribution) and one QI effectiveness outcome: patient-level remission status as defined in the Cannabis Youth Treatment Study at 6-month followup.¹⁰⁶ The authors report event rate ratios (for the outcome, “number of therapists”) and ORs for the other two outcomes, as well as 95% CIs for differences between groups.

Intermediate Outcomes

Therapists assigned to the P4P condition had significantly higher likelihood of demonstrating A-CRA competence than the IAU therapists (Table 17). Patients working with therapists assigned to the P4P condition were more likely to get target levels of A-CRA treatment procedures and sessions (adherence and fidelity) than patients of therapists assigned to the IAU condition.

Patient Health and Service Utilization Outcomes

The study found no significant difference in the likelihood of remission for adolescents working with therapists in the P4P conditions versus those working with therapists in the IAU condition over a 6-month time period (Table 17).

Risk of Bias Considerations

We rated the study as having medium risk of bias because of high rates of patient attrition (20% for the intermediate outcome of percentage of patients getting target levels of A-CRA treatment procedures and sessions and 49% for the patient health outcome of patient remission status).⁸⁴ In addition, blinding of outcome assessors to the outcome status of participants was unclear.

Conclusion and Strength of Evidence

We graded the strength of evidence for a P4P strategy seeking to improve the implementation of an EBT to treat adolescents with substance use disorders as moderate. The evidence consisted of a single RCT with medium study limitations and precise results. The strategy comprised a provider incentive component. The study yielded moderate strength of evidence for benefit of P4P on one intermediate outcome (practitioner competence/skill) and low strength of evidence for benefit of P4P on another intermediate outcome (practitioner adherence/program fidelity). Finally, we graded the strength of evidence as low strength for no benefit of P4P on patient health and service utilization outcomes (change in mental health symptoms: remission) (Table F-12).

Table 17. Paying practitioners for performance in successfully delivering an EBP intervention: Summary of results

Study Design/Risk of Bias	Study Arms		Outcome Reported by Study and Time Period	Results
	Differences in Strategy Components Across Study Arms	N Analyzed		
Garner et al., 2012 ⁸⁴ Cluster RCT/Medium	G1: Paying practitioners for performance (P4P) in successfully delivering an EBP intervention (A-CRA)	G1: 14 organizations, 49 therapists G2: 15 organizations, 49 therapists	Demonstration of practitioner competent delivery of all components of at least 1 A-CRA treatment procedure during the same treatment session (A-CRA competence, number of events)	Event rate ratio=2.24, 95% CI, 1.12 to 4.48
	G2: Implementation of an EBP intervention (A-CRA) as usual	G1: 14 organizations, 45 therapists, 429 patients G2: 15 organizations, 40 therapists, 507 patients	Demonstration of practitioner delivery of at least 10 of 12 specific A-CRA procedures within the first 14 weeks of treatment and in no fewer than 7 sessions for each patient (adherence to target A-CRA, yes/no)	OR, 5.19, 95% CI, 1.53 to 17.62
	Single difference in financial provider component (provider incentives) across study arms (comparison group strategy contained no components)	G1: 14 organizations, 41 therapists, 254 patients G2: 15 organizations, 40 therapists, 346 patients	Final health/patient-centered outcomes: Mental health symptoms, syndromes, or disorders as measured by patient remission at 6-month followup (yes/no)	OR, 0.68; 95% CI, 0.35 to 1.33

A-CRA = Adolescent Community Reinforcement Approach; CI = confidence interval; EBP = evidence-based practice; G = group; N = number; OR = odds ratio; P4P = pay for performance; RCT = randomized controlled trial.

Program To Improve Organizational Culture and Climate

Study Description

Two studies with outcomes reported in three publications, conducted by the same group of authors, evaluated the Availability, Responsiveness and Continuity (ARC) program to improve organizational culture and climate. ARC's ultimate goal is to increase implementation of EBPs^{14,67} by embedding principles of service system effectiveness within an organization; training clinicians to identify and address barriers to delivering effective services; and promoting a collaborative, supportive culture toward service innovation and improvement.¹⁰⁷ Thus, ARC involves multiple activities—targeted at stakeholders, management, and service practitioners—that are all specifically designed to improve implementation by changing the social context of an organization to improve its ability to adopt effective treatments, strengthen adherence to protocols and strategies, develop therapeutic alliance between providers and patients, and sustain effective interventions.¹⁰⁸ An ARC specialist works with others to plan and endorse implementation activities, communicate a vision for implementation efforts, set performance standards, facilitate information sharing, identify services barriers, and develop plans to remove service barriers. The strategy targets social, strategic, and technological factors via organizational and interorganizational components, the diffusion of innovation, and technology transfer.¹⁰⁹

The initial study by this set of authors, published in 2010, used a 2X2 RCT design of an EBP intervention called MST and ARC, resulting in four arms: MST+ARC, MST only, ARC only, and usual care across 14 rural Appalachian counties. The strategy lasted for 12 months and evaluated youth behavior problems, youth placement, and therapist adherence.¹⁴ Outcomes were measured at 6 and 18 months following baseline. Comparisons to examine the effectiveness of the ARC strategy differed by outcome and are described, below. A second study of 26 community mental health programs for youth from a multisite mental health service system randomized the programs to ARC or usual care and sustained the strategy for 18 months to allow sufficient time to observe organizational change.^{67,68} The first publication from this trial focused on practitioner intermediate outcomes (satisfaction/acceptability).⁶⁷ The second publication from this trial focused on youth outcomes as reported by the youth's caregiver using the Shortform Assessment for Children, a standardized measure of youth psychosocial functioning (range 0–92).⁶⁸ This study, however, dropped the 8 community health programs that treated young adults (ages 18 to 24) and instead included 18 of the original 26 community health programs that served youth ages 5 to 18. Outcomes were measured every month for 6 months following intake. The study notes that youth who entered care before the programs had completed the entire 18-month implementation of ARC experienced less improvement in the programs assigned to ARC than youth in the programs assigned to the control condition. The outcomes reported in the paper, therefore, were only for youth who started the program after the 18-month implementation of ARC had finished.

Intermediate Outcomes

For this review, we focus on comparisons made between the groups that received ARC (ARC and ARC+MST) vs. those that did not (MST only and usual care), as the authors do not present comparisons of intermediate outcomes between the individual study groups. The original study reported no differences (but did not provide details) on any measure of therapist fidelity to MST (therapist adherence as reported by caregiver, therapist rating of supervisor, audio-coded therapist adherence) for the groups receiving ARC versus those that did not receive ARC (Table 18).¹⁴

The second study evaluated the Organizational Social Context measure for 126 clinicians across 26 programs, with a primary domain for morale (including subdomains of job satisfaction and commitment); three domains for organizational climate, namely engagement (personalization of engagement and personal accomplishment), functionality (growth and advancement, clarity of role, cooperation), and stress (emotional exhaustion, role conflict, role overload); and three domains for organizational culture, namely rigidity (centralization, formalization), proficiency (responsiveness, competency), and resistance (apathy, suppression).⁶⁷ Although all domains were in the expected direction (with the exception of suppression), the study reported statistically significant findings for morale, engagement, functionality, and rigidity only.⁶⁷ The second publication from the second study focused on parent-reported youth problem behaviors at intake and at 1-month intervals for 6 months after intake⁶⁸ and found that youth in the ARC arm had significantly fewer problem behaviors reported at followup than those assigned to the control condition.⁶⁸

Table 18. Program to improve organizational culture and climate: Summary of results

Study Arms				
Study Design/Risk of Bias	Differences in Strategy Components Across Study Arms	N Analyzed	Outcome Reported by Study and Time Period	Results
Glisson et al., 2010 ¹⁴ Two-stage RCT/Medium	G1: Program to improve organizational climate and culture with or without MST (ARC+MST and ARC only)	G1: 291 G2: 305	Caregiver rating of therapist adherence on the 28-item MST Therapist Adherence Measure—Revised (TAM-R)	No differences in caregiver-reported MST therapist adherence between ARC and non-ARC conditions, details NR
	G2: No ARC program to improve organizational climate and culture (MST only + usual care)	G1: 291 G2: 307	Rating of therapist adherence based on audio coding of tapes from therapy sessions (TAM-R)	No differences in audio-coded ratings of therapist adherence between ARC and non-ARC conditions, details NR
	5 professional components (distribution of educational materials, educational meetings, educational outreach visits, audit and feedback, and one other—training and cognitive models to improve effectiveness)	G1: NR by arm G2: NR by arm N overall: 257 (91% of therapists)	Therapist rating of supervisor adherence based on SAM	No differences in SAM ratings of supervisor adherence between ARC and non-ARC conditions, details NR
	1 organizational provider-oriented component (satisfaction of providers with conditions of their work)			
	G1: Program to improve organizational climate and culture, ARC, only G2: Usual care	G1: NR G2: NR	Hierarchical modeling coefficient of probability of entering an out-of-home placement in the 18-month followup period	Out-of-home placement lower for ARC group but not significantly so ($\beta = -0.59$, 95% CI = -1.17 to 0, $p = 0.05$)
	All components (5 professional components—distribution of educational materials, educational meetings, educational outreach visits, audit and feedback, and one other—training and cognitive models to			

Table 18. Program to improve organizational culture and climate: Summary of results (continued)

Study Arms		N Analyzed	Outcome Reported by Study and Time Period	Results
Study Design/Risk of Bias	Differences in Strategy Components Across Study Arms			
	improve effectiveness, 1 organizational provider-oriented component—satisfaction of providers with conditions of their work (comparison group strategy contained no components)		Child Behavior Checklist Scores at 18 months	G1: 57.30 G2: 56.75 G3: 55.30 G4: 55.85 Differences reported as not significant.
Glisson et al., 2012 ⁶⁷ Cluster RCT/Unclear	G1: Program to improve organizational climate and culture, ARC G2: Control	G1: 13 programs (N of clinicians by arm NR) G2: 13 programs (N of clinicians by arm NR)	Morale coefficient; 95% CI, p	G1 vs. G2: 4.761; 95% CI, 2.239 to 7.283; p=0.001
			Job satisfaction coefficient; 95% CI, p	G1 vs. G2: 2.338; 95% CI, 0.929 to 3.747; p=0.003
	All components (5 professional components—distribution of educational materials, educational meetings, educational outreach visits, audit and feedback, and one other—training and cognitive models to improve effectiveness and 1 organizational provider-oriented component—satisfaction of practitioners with conditions of their work) differed across study arms (comparison group strategy contained no components)	Total n of clinicians: 197	Organizational commitment coefficient; 95% CI, p	G1 vs. G2: 2.322; 95% CI, 1.110 to 3.534; p=0.001
			Stress coefficient; 95% CI, p	G1 vs. G2: -1.095; 95% CI, -6.305 to 4.115; p=0.667
			Emotional exhaustion coefficient; 95% CI, p	G1 vs. G2: -0.085; 95% CI, -2.024 to 1.854; p=0.929
			Role conflict coefficient; 95% CI, p	G1 vs. G2: -1.555; 95% CI, -2.999 to -0.111; p=0.036
			Role overload coefficient; 95% CI, p	G1 vs. G2: 0.566; 95% CI, -1.420 to 2.552; p=0.561
			Engagement coefficient; 95% CI, p	G1 vs. G2: 1.591; 95% CI, 0.217 to 2.965; p=0.025
			Personalization coefficient; 95% CI, p	G1 vs. G2: 1.275; 95% CI, 0.298 to 2.252; p=0.013
			Personal accomplishment coefficient; 95% CI, p	G1 vs. G2: 0.398; 95% CI, -0.274 to 1.070; p=0.233
			Functionality coefficient; 95% CI, p	G1 vs. G2: 2.845; 95% CI, 0.356 to 5.334; p=0.027
			Growth and advancement coefficient; 95% CI, p	G1 vs. G2: 1.370; 95% CI, 0.170 to 2.570; p=0.027

Table 18. Program to improve organizational culture and climate: Summary of results (continued)

Study Arms				
Study Design/Risk of Bias	Differences in Strategy Components Across Study Arms	N Analyzed	Outcome Reported by Study and Time Period	Results
			Role clarity coefficient; 95% CI, p	G1 vs. G2: 0.784; 95% CI, -0.292 to 1.860; p=0.145
			Cooperation coefficient; 95% CI, p	G1 vs. G2: 0.585; 95% CI, -0.259 to 1.429; p=0.166
			Rigidity coefficient; 95% CI, p	G1 vs. G2: -2.689; 95% CI, -4.684 to -0.694; p=0.011
			Centralization coefficient; 95% CI, p	G1 vs. G2: -1.874; 95% CI, -2.923 to -0.825; p=0.001
			Formalization coefficient; 95% CI, p	G1 vs. G2: -0.992; 95% CI, -2.103 to 0.119; p=0.077
			Proficiency coefficient; 95% CI, p	G1 vs. G2: 1.154; 95% CI, -0.903 to 3.211; p=0.258
			Responsiveness coefficient; 95% CI, p	G1 vs. G2: 0.305; 95% CI, -0.717 to 1.327; p=0.543
			Competency coefficient; 95% CI, p	G1 vs. G2: 0.720; 95% CI, -0.542 to 1.982; p=0.250
			Resistance coefficient; 95% CI, p	G1 vs. G2: -0.523; 95% CI, -3.194 to 2.148; p=0.689
			Apathy coefficient; 95% CI, p	G1 vs. G2: -1.105; 95% CI, -2.077 to -0.133; p=0.028
			Suppression coefficient; 95% CI, p	G1 vs. G2: 0.078; 95% CI, -1.536 to 1.692; p=0.921
Glisson et al., 2012 ⁶⁷ Cluster RCT/Unclear	G1: Program to improve organizational climate and culture, ARC G2: Control All components (5 professional components—distribution of educational materials, educational meetings, educational outreach visits, audit and feedback, and one other—training and cognitive models to	1; 352 caregivers of youth ages 5–18 in 18 programs	Child Behavior Checklist Scores every month for 6 months (following 18 month implementation of ARC by organization)	Effect size=0.29

Table 18. Program to improve organizational culture and climate: Summary of results (continued)

Study Arms				
Study Design/Risk of Bias	Differences in Strategy Components Across Study Arms	N Analyzed	Outcome Reported by Study and Time Period	Results
	improve effectiveness and 1 organizational provider-oriented component—satisfaction of practitioners with conditions of their work) differed across study arms (comparison group strategy contained no components)			

ARC = Availability, Responsiveness and Continuity; CI confidence interval; EBP = evidence-based practice; G = group; MST = multisystemic therapy; N = number; n = number; NR = not reported; p = p-value; RCT = randomized controlled trial; SAM = Supervisor Adherence Measure. TAM-R = Therapist Adherence Measure—Revised.

Patient Health and Service Utilization Outcomes

For the patient health and service utilization outcomes in the original study, differences between the ARC only and usual-care group were reported, but those from the ARC+MST group versus MST-only group were not. This study found that out-of-home placement was lower for youth ARC-only conditions when compared with usual care, but the significance failed to drop below the threshold (Table 19).¹⁴ The adjusted relative odds of a youth entering an out-of-home placement in a county that received the ARC intervention were lower than the odds of out-of-home placement in a county that did not participate in the ARC intervention, but the difference only approached significance ($p=0.05$). The study found that child behavior problems (measured by the Child Behavior Checklist Total Problem T Scores) at 6 months did not significantly differ between the ARC-only and usual-care groups. By the end of the 18-month followup, there were no significant differences in child behavior problems.

The second publication from the second study focused on parent-reported youth problem behaviors at intake and at 1-month intervals for 6 months after intake⁶⁸ and found that youth in the ARC arm had significantly fewer problem behaviors reported at followup than those assigned to the control condition (effect size=0.29).⁶⁸

Risk of Bias Considerations

The original study¹⁴ had a rate of attrition over 20 percent. It also did not offer information on fidelity and outcome assessor blinding and had the potential for recall bias for out-of-home placement. As a result, we rated the study as having medium risk of bias. The followup study replaced 2 of 26 sites that were found ineligible. They did not report key details such as differences in baseline characteristics and controls for the potential differences from replacement, so it was not possible to judge the effect of this alteration on the outcomes.⁶⁷ As a result, we rated the followup study as having unclear risk of bias.

Conclusion and Strength of Evidence

Two RCTs reported in three publications tested the ARC program to improve organizational culture and climate. The strategy included educational meetings, educational materials,

educational outreach visits, provider satisfaction, and audit and feedback (professional components) and one organizational provider components, improving the satisfaction of providers with their work. We graded the evidence from these studies as low for *no benefit* for some outcomes and low for *benefit* for others (medium study limitations, precise results). Only one study, however, provided evidence on each outcome category (Table F-13). One study yielded low strength of evidence that ARC does not improve practitioner adherence to MST. A second yielded low strength of evidence that ARC improves some measures of practitioner satisfaction/acceptability. One study yielded low strength of evidence for no benefit that ARC reduces the rate of out-of-home placement or reduces mean child problem behavior scores when compared with usual care. One study offered low strength of evidence that ARC improves child behavior as compared with usual care in the first 6 months of followup (after the organizations had completed the 18-month implementation of ARC).

Colocating an EBP Program in Primary Care Study Description

A single CCT⁹⁴ of high risk of bias evaluated the effect of colocating behavioral health care in primary care, specifically the Positive Parenting Program (Triple P), which has been shown to be effective in clinical trials. The study assigned four community-based, hospital-affiliated primary care pediatric practices in northeastern Ohio to colocated behavioral parent training, provided at the primary care office (the active arm) or enhanced referral to behavioral parent training delivered in settings outside the primary care office (the control arm). Additionally, the study considered the inclusion of a usual-care arm, from seven community-based, hospital-affiliated primary care pediatric practices where patients could be referred to the behavioral parenting program routinely offered at the hospital. Only one family in the usual-care arm sought a referral, so the study authors did not include the usual care arm in the final analyses. Parents in the colocation strategy arm were more likely to be younger and unemployed than parents in the control (enhanced referral) arm. Parental mean age was 31.8 (30.7 in the strategy arm and 34.8 in the control arm). Thirteen parents (59.1%) in the colocated arm and 1 parent (11.1%) in the enhanced-referral condition were unemployed.

Outcomes of interest included rate of attendance of first Triple P appointments by parents, number of sessions attended, parental ratings of child externalizing behavior using the Eyberg Child Behavior Inventory, parent self-rated positive and negative affect as rated by the Positive and Negative Affect Schedule, and self-rated dysfunctional parenting as rated by the Parenting Scale.

Intermediate Outcomes

The study evaluated one intermediate outcome: patient access to care. The study found that parents in the strategy arm were more likely to attend their first scheduled Triple P appointment than in the enhanced referral condition (Table 19). The study did not control or adjust for baseline differences in study arms.

Table 19. Colocating an EBP program in primary care: Summary of results

Study Design/Risk of Bias	Study Arms Differences in Strategy Components Across Study Arms	N Analyzed	Outcome Reported by Study and Time Period	Results
Wildman et al., 2012 ⁹⁴ CCT/High	G1: Colocation of an EBP program (Triple P) in primary care G2: Enhanced referral to an EBP program (Triple P)	G1: 11,213 G2: 9,704	Proportion attending first scheduled Triple P appointment	G1: 43/11,213 G2: 12/9,704 OR, 3.10; 95% CI, 1.63 to 5.89
	Single difference in one organizational structural component (enhanced referrals and choice of treatment) across study arms (comparison group strategy contained no components)	G1: 43 G2: 12	Mean number of sessions attended (SD)	G1: 3.07 (2.42) G2: 4.08 (2.71) Calculated mean difference: -1.01; 95% CI, -2.60 to 0.58; p>0.2

CCT = controlled clinical trial; CI = confidence interval; EBP = evidence-based practice; G = group; N = number; OR = odds ratio; p = p-value; SD = standard deviation; Triple P = Positive Parenting Program.

Patient Health and Service Utilization Outcomes

The study evaluated one patient outcome: health care utilization. Parents in the colocated arm attended fewer Triple P sessions, on average, than the control arm, although the CI around the mean difference is wide and the difference is not statistically significant.

Risk of Bias Considerations

We rated this study as having high risk of bias. The authors did not adjust the study results for baseline differences (colocation parents were older and unemployed compared with the control group parents), and between-practice differences in culture were not considered. Little information was given regarding how the practitioners explained the program to patients and whether there other patient, primary care practitioner, or practice attributes differed between groups. Whether all clinics were randomized to a condition, whether outcome assessors were blinded to condition, and levels of attrition also were unclear.

Conclusion and Strength of Evidence

A single publication presented data from a strategy on colocating behavioral health care in primary care settings. The strategy involved changing the scope of benefits. We graded the strength of evidence as insufficient for healthcare utilization and low strength of evidence. Other analyses yielded low strength of evidence for patient access to care (Table F-14).

Embedding a Behavioral Health Care Practitioner in Primary Care

Study Description

A single nonblinded cluster randomized, hybrid implementation and effectiveness trial⁹² with medium risk of bias compared implementation of an EBT between two groups. The EBT, Screening, Brief Intervention, and Referral to Treatment (SBIRT), is an early intervention for substance use. The study compared outcomes for adolescent patients receiving SBIRT from their trained pediatricians with outcomes for adolescents receiving SBIRT from a behavioral health care practitioner (BHCP) working in coordination with their pediatricians. The study also

included a usual-care group of pediatricians who did not receive SBIRT training. We do not report on comparisons of the active treatment with usual-care arms because the effects of SBIRT cannot be separated from the effects of the implementation in this study.

Fifty-two pediatricians from a large general pediatrics clinic in an integrated health care system were randomized to one of three SBIRT implementation arms. Patients of these pediatricians, ages 12 to 18 years, were eligible for the study. Each adolescent completed the screening tool, the Teen Well Check Questionnaire, at registration for their well-child visit. The completed forms were stored in their electronic health record (EHR) for review by their pediatricians. Positive screens on the Teen Well Check Questionnaire, as indicated by past-year indication of alcohol, marijuana, or other drug use and/or mood symptoms or suicidality, triggered additional assessment, brief intervention, and referral via the SBIRT protocol that were done during the current visit. In the pediatrician-only group, the pediatrician conducted the assessment, brief intervention, and referrals. In the BHCP group, pediatricians called the BHCP upon encountering a patient who endorsed substance use or mental health risk during screening. The BHCP was invited to come into the examination room to meet with the patient and conduct the assessment, brief intervention, and referral if available, or spoke with the patient to set up a time to conduct the additional SBIRT protocols.

In the two SBIRT groups, investigators trained pediatricians and BHCPs to provide brief interventions that consisted of feedback, advice, and goal setting. If indicated, referrals were made, by the pediatrician or BHCP who completed the SBIRT protocol, to additional substance use or mental health departments within the integrated health care system.

The three outcomes of interest were assessment, brief intervention, and referrals, compared via multivariable logistic regression models adjusted for clustering of patients within pediatricians and patient characteristics (age, sex, and ethnicity).

Intermediate Outcomes

Three outcomes of practitioner adherence/program model fidelity were compared across study arms. The study found no differences in the proportion of patients being assessed for substance use between the pediatrician-only and the BHCP groups (Table 20). The BHCP group patients, however, were more likely to receive a brief intervention than the pediatrician-only group patients but less likely than the pediatrician-only group patients to be referred for treatment.

Patient Health and Service Utilization Outcomes

The study did not report any patient health and service utilization outcomes but did cite two prior organizations (the National Institute on Alcohol Abuse and Alcoholism and the World Health Organization) that endorse SBIRT provided in primary care as an EBT to reducing substance use among adults.^{110,111}

Table 20. Embedding a BHCP in primary care: Summary of results

Study Design/Risk of Bias	Study Arms Differences in Strategy Components Across Study Arms	N Analyzed	Outcome Reported by Study and Time Period	Results	
Sterling et al., 2015 ⁹² RCT/Medium	G1: Implementation of an EBP by a pediatrician G2: Implementation of an EBP by an embedded BHCP	G1: 584 (14 pediatricians) G2: 671 (16 pediatricians with embedded BHCPs)	Assessment (proportion)	G1: 149/584 (25.5%) G2: 164/671 (24.3%) aOR, 0.93; 95% CI, 0.72 to 1.21	
			Brief intervention (proportion)	G1: 96/584 (16.4%) G2: 171/671 (25.5%) aOR, 1.74; 95% CI, 1.31 to 2.31	
	Single difference in one organizational provider component (use of clinical multidisciplinary teams) across study arms		Referral to treatment (proportion)	Proportions for each group not reported aOR, 0.58; 95% CI, 0.43 to 0.78	

aOR = adjusted odds ratio; BHCP: behavioral health care provider; CI = confidence interval; EBP = evidence-based practice; G = group; N = number; RCT = randomized controlled trial.

Risk of Bias Considerations

We rated this study as having medium risk of bias. The study randomized pediatricians to groups, but the randomization was not blinded. Baseline characteristics of the pediatrician-only patients did not significantly differ from those of the pediatricians with embedded BHCP patients. The outcome assessors also were not blinded. BHCPs in the embedded group were slightly more likely than pediatricians in the pediatrician-only group to attend at least two sessions of SBIRT training (76.5% vs. 47.1%, calculated $p=0.08$).

Conclusion and Strength of Evidence

We graded the strength of evidence on a strategy using embedded BHCPs working with pediatricians to implement an EBT as low for no benefit. The evidence consisted of a single RCT with medium study limitations. We were unable to assess precision. The strategy included a multidisciplinary team component. This nonblinded, cluster randomized trial yielded low strength of evidence that the strategy improves practitioner adherence to brief substance use intervention and lowers referrals to treatment as compared with pediatrician-only implementation groups (Table F-15).

Finding Recipes for Success

We turned to qualitative comparative analysis (QCA) to understand what combinations of components might serve as recipes for success.

Inputs

Appendix H illustrates inputs for each condition set and each outcome used in the QCA for each study.

Models

We examined six models (three different combinations of condition sets with two different outcomes) and chose the model that demonstrated a set relationship with the highest level of consistency and coverage. (The other models did not have a strong set relationship and are not shown.) Our model included the presence or absence of one or more professional components, financial components, organizational provider components, and/or organizational structural components as related to having a significant improvement in a majority of practitioner-, system-, and patient-level intermediate outcomes (i.e., the super outcome).

Solutions

Our analysis included 17 studies; 12 showed significant improvements (i.e., significant improvement in majority of practitioner, system, or patient intermediate outcomes or at least one patient health or service utilization outcome showing at least low strength of evidence for benefit coded as 1). Five did not.

In the Boolean analysis of the truth table, no conditions were individually necessary; and no necessary combinations occurred. Having a finance component or having a component that included changing the scope or nature of benefits or services and patient choice of treatment were individually sufficient; however, each of these sufficient conditions represent a single study and should not be over-interpreted as a definitive pathway to success.

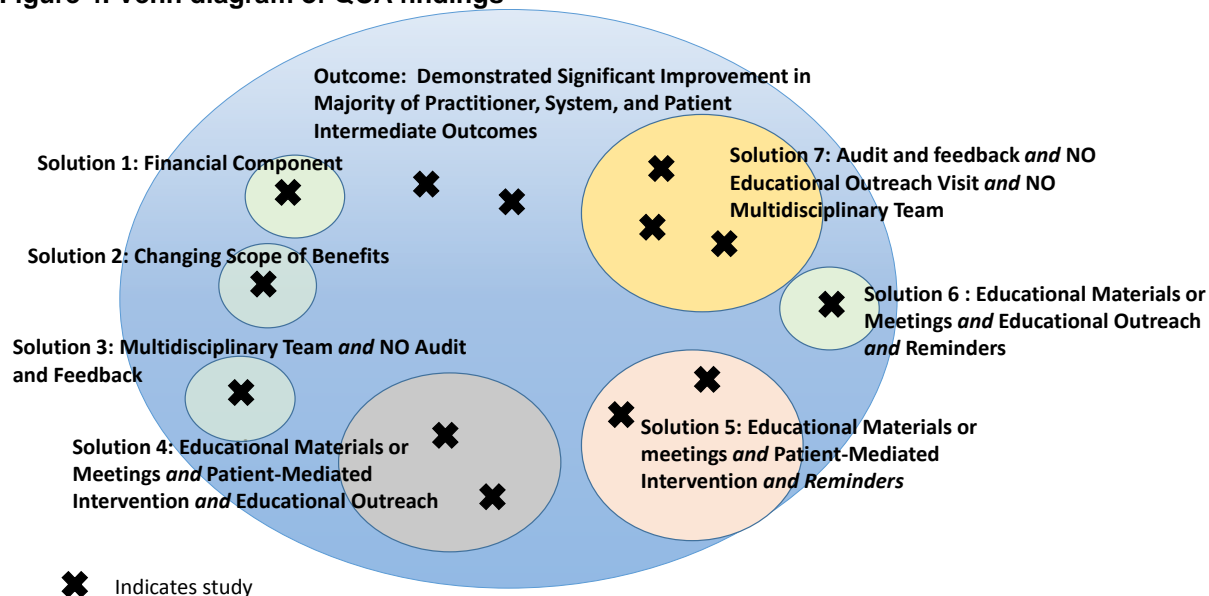
Analysis of sufficient combinations for achieving significant improvements showed five additional configural solutions, each with 100% consistency. Taken together, the solutions had 83% coverage, accounting for 10 of the 12 studies that demonstrated at least low strength of evidence of benefit for at least one outcome. These solutions were:

- Using clinical multidisciplinary teams and *not* having an audit and feedback component
- Having educational materials or meetings, patient-mediated interventions, and educational outreach; *or*
- Having educational materials or meetings, patient-mediated interventions, and reminders; *or*
- Having educational materials or meetings, educational outreach, and reminders; *or*
- Having an audit and feedback component and *not* having educational outreach and *not* using a clinical multidisciplinary team.

Table 21 displays the solutions, their individual consistency and coverage values, and the total solution consistency and coverage. The QCA yielded seven solutions associated with success, described below and shown in the Venn diagram in Figure 4. Four of the solutions included only one study each. Two solutions included two studies each. And one solution included three studies. Two of the studies that showed benefit did not belong to any of the solutions yielded by the QCA. Of note, one study met criteria for two different solutions associated with success.

Table 21. Sufficient combinations for achieving implementation effectiveness

Sufficient Combination	Raw Coverage	Unique Coverage	Consistency	Studies included in Combination
1. Having a financial component	0.083	0.083	1.000	Garner et al., 2012 ⁸⁴
2. Changing the scope of patient benefits component	0.083	0.083	1.000	Wildman et al., 2012 ¹¹²
3. Having a clinical multidisciplinary team components with NOT having an audit and feedback component	0.083	0.083	1.000	Sterling et al., 2015 ⁹²
4. Having an educational materials or meetings component and a patient-mediated intervention component and an educational outreach component	0.167	0.167	1.000	Gully et al., 2008 ⁶⁶ Study 1 and Study 2;
5. Having an educational materials or meetings component and a patient-mediated intervention component and a reminders component	0.167	0.083	1.000	Carroll et al., 2013 ⁸⁹ Epstein et al., 2011 ⁸⁵
6. Having an educational materials or meetings component and an educational outreach component and a reminders component	0.083	0.083	1.000	Ronsley et al., 2012 ⁹⁵
7. Having an audit and feedback component with NOT having an educational outreach component and NOT having a clinical multidisciplinary team component	0.250	0.167	1.000	Bickman et al., 2011 ¹³ , Lockman et al., 2009 ⁸⁸ G1 vs. G3; Epstein et al., 2011 ⁸⁵
Total solution consistency=1.000				
Total solution coverage=0.8333				

Figure 4. Venn diagram of QCA findings

QCA = Qualitative Comparative Analysis

All seven solutions had perfect consistency and accounted for 10 of the 12 cases that demonstrated improvements in practitioner, system, or patient outcomes or found low strength of evidence for benefit for at least one patient health or service utilization outcomes (i.e., 0.833 total coverage). The last solution accounted for the most (N=3) studies that achieved improvements;

Solutions 1, 2, 3, and 6 accounted for 1 study each. Solutions 4 and 5 each accounted for 2 studies each. These solutions could not account for 2 studies that showed improvements: Glisson et al., 2012⁶⁷ and Lester et al., 2009.⁹⁰ The latter study had an educational materials or meetings component and an educational outreach component *only* with no patient-mediated intervention, audit and feedback, reminders, financial, having a clinical multidisciplinary team, or changing the scope of patient benefits components. This combination of components is similar to three of the solutions that accounted for 5 studies that showed benefit incorporated the presence of *three* (instead of just *two*) different professional components each (educational materials or meetings plus educational outreach plus reminders OR educational materials or meetings plus patient-mediated interventions plus reminders OR educational materials or meetings plus patient-mediated interventions plus educational outreach), but not the other components. The two Glisson studies had the same combination of components and one study showed benefit (2012) while the other did not (2010). We are unable to determine why only one showed benefit.

Key Question 2: Harms

A single study, focused on general professional training to identify and refer first-episode cases of psychosis, reported harms.⁹⁰

Key Points

- Only one study reported on the harms of strategies to improve mental health in children and adolescents.
- The study did not find any harms associated with a strategy to train general practitioners to improve identification of first-episode cases of psychosis.

Detailed Study Description

A single study that examined harms associated with a strategy to improve the mental health care of children and adolescents met our inclusion/exclusion criteria. The study,⁹⁰ described previously, was classified as a professional training strategy. This study found no harms associated with a practitioner education strategy to improve the rates of referral to early intervention services for first-episode psychosis experienced by young people ages 14 to 30 (Table 22). The investigators found no differences between strategy and control practices with respect to patients who reported adverse events (n=0 in both groups, details of specific adverse events measured not reported) and no increase in false-positive referrals from primary care to early-intervention services before and during the study. The authors report that the rate of false-positive referrals within practices “remained between 12.7 percent and 13.4 percent before and during the study” (p. e188); however, differences between groups were not reported.

Table 22. Harms associated with training practitioners to identify and refer cases: Summary of results

Study Design/Risk of Bias	Study Arms		Outcome Reported by Study and Time Period	Results
	Differences in Strategy Components Across Study Arms	N Analyzed		
Lester et al., 2009 ⁹⁰ Stratified cluster RCT/High	G1: Professional training to identify and refer first-episode cases of psychosis G2: Usual care All professional components (educational meetings, local consensus process, educational outreach visits, marketing) differed across arms (comparison group strategy contained no components)	G1: 55 practices (97 patients) G2: 55 practices (82 patients)	Adverse events within 4 months False-positive referrals from primary care	0 reported in both groups NR other than that there was no increase, remaining between 12.7% and 13.4% before and during the study

G = group; N = number; NR= not reported; RCT = randomized controlled trial.

Conclusion and Strength of Evidence

A single publication with high risk of bias presented data from a practitioner education strategy and yielded insufficient evidence for patient harms (i.e., side effects including adverse events and false-positive referral rates) (Table F-16).

Key Question 3: Moderators

Four studies examined moderators of the effectiveness of strategies on outcomes. Three of these studies examined treatment intensity as a moderator of the effectiveness of professional training of school counselors to prevent children at high risk for aggressive behaviors from developing externalizing problems,⁸⁸ a financial or organizational change of adding weekly feedback to therapists providing home-based mental health care for children and adolescents,¹³ and a financial or organizational change of a collaborative consultative model to improve the use of titration trials and medication monitoring during medication maintenance for children with ADHD.⁸⁶ The other study examined whether fidelity to protocol improved the effectiveness of a P4P strategy to improve treatment implementation of an EBP for adolescent substance use disorders.⁸⁴

Key Points

- The strength of evidence of the three studies that examined treatment intensity as a moderator varied from having grades of low for benefit (for the association between prevention of externalizing behaviors and patient mental health symptom improvement) to insufficient (for the other two studies that examined treatment intensity as a moderator of the effectiveness of a weekly feedback strategy to improve home-based mental health care and of a collaborative consultative strategy to improve the use of EBPs) due to myriad study limitations and inability to determine the precision of findings.

- The strength of evidence was graded as low for no benefit for the moderating effect of fidelity to the protocol on effectiveness of a P4P strategy to improve treatment implementation of an EBP for adolescent substance use disorders.

Detailed Study Description

Moderating Effects of Intervention Effects—Intensity of the Intervention

Study Description

Three studies addressed the moderating effects of higher intensity of the strategy on outcomes. One study⁸⁸ of unclear risk of bias examined the effectiveness of professional training of school counselors to use the CP program with third-grade children at high risk for aggressive behaviors as they transitioned to middle school. Counselors were randomly assigned to one of three conditions: CP-TF, CP-BT, or comparison; thus, the two strategy groups differed with respect to training intensity. CP-TF was more intense and included four components, while CP-BT included two training components. The findings indicated that the CP-TF group had greater decreases in externalizing behavioral problems as rated by teachers than the comparison group (mean difference=G1 vs. G3: OR, 0.66; 95% CI, 0.41 to 0.91), greater decreases in child-rated minor assaults than the comparison group (G1 vs. G3: OR, 0.78; 95% CI, 0.62 to 0.99), and greater improvements in teacher-rated social/academic competence than the comparison group (G1 vs. G3: OR, 1.42; 95% CI, 1.10 to 1.83). None of the outcomes significantly differed for the CP-BT and comparison groups. The authors then compared the outcomes for the CP-TF and CP-BT groups to determine whether improvements in outcomes differed by training intensity. The authors also compared the two strategy groups on provider protocol adherence/program fidelity and patient access to care and treatment engagement intermediate outcomes.

A second study,¹³ categorized as targeting a financial or organizational change, evaluated the addition of weekly feedback to therapists (the CFS) in addition to standard 90-day feedback on symptoms and functional status change of children receiving home-based mental health treatment. Regarding intermediate outcomes, the investigators reported implementation failure in one arm. Regarding patient health and service utilization outcomes, the study reported a higher rate of change in improvement in SFSS in the experimental group (effect sizes of 0.18, 0.24, and 0.27 for youths, clinicians, and caregivers, respectively), calculated by study authors using the HLM-estimated coefficients measured at the average length of stay in the CFS. The authors sought to understand the dose-response effect of the strategy, specifically whether there was an association between the proportion of reports viewed and outcomes (symptoms and functional status).

A third study,⁸⁶ also categorized as targeting a financial or organizational change, examined the use of a collaborative consultative model to improve the use of titration trials and medication monitoring during medication maintenance for children with ADHD. The study found a higher rate of practitioner uptake of titration trials in the strategy arm and no effect (or no consistent effect) of the strategy on uptake of medication monitoring during the maintenance phase of the drug, practitioner competency (measured by cited obstacles to implementing EBPs), or ADHD symptoms. The study then sought to understand the effect of undertaking a titration trial on ADHD symptoms.

Intermediate Outcomes

The study on varying training intensity for school counselors⁸⁸ compared the CP-TF and CP-BT groups on practitioner protocol adherence, program model fidelity, patient access to care, and treatment engagement intermediate outcomes (Table 23). The authors reported no significant differences in rates of child sessions scheduled; however, calculated mean differences indicated that the CP-TF group had fewer sessions scheduled for children and for parents than the CP-BT. There were no significant differences between groups with respect to child and parent attendance and parent treatment engagement. For children, however, treatment engagement was significantly better for the CP-TF group than for the CP-BT group. Practitioners in the CP-TF group also had a greater number of contacts with trainers than those in the CP-BT group.

Table 23. Intensity of the strategy as a moderator of the effectiveness of the strategy: Summary of results (intermediate outcomes)

Study Design/Risk of Bias	Study Arms	N Analyzed	Outcome Reported by Study and Time Period	Results
	Differences in Strategy Components Across Study Arms			
Lochman et al., 2009 ⁸⁸	G1: Professional training plus feedback to implement an EBP intervention (CP-TF)	G1: 168	Calculated mean difference (and 95% CI) in rates of child sessions and parent sessions scheduled (G1–G2)	-3.10 (-3.60 to -2.60) child -0.50 (-0.24 to -0.77) parent
	G2: Professional training only to implement an EBP intervention (CP-BT)	G2: 183	Calculated mean difference (and 95% CI) in rates of attendance for child and parent sessions (G1–G2)	0.01 (-0.08 to 0.11) child -0.04 (-0.12 to 0.05) parent
	G3: Control	G3: 180	Calculated mean difference (and 95% CI) in number of strategy objectives completed for child and parent sessions (G1–G2)	0 (-0.21 to 0.21) child 0 (-0.21 to 0.21) parent
	Difference across the three study arms varied: two strategy arms and one control arm—training plus feedback arm—had all five components, training-only arm had educational meetings and marketing components, and control arm had none of these components)		Calculated mean difference (and 95% CI) in number of contacts of practitioners with trainers (G1–G2)	18.1 (17.51 to 18.69) practitioner
			Calculated mean difference (and 95% CI) in ratings of counselors' engagement with children and with parents (G1–G2)	0.30 (0.28 to 0.32) children -0.10 (-0.12 to -0.08) parent

CI = confidence interval; CP-BT = Coping Power-Basic Training; CP-TF = Coping Power-Training plus Feedback; G = group; N = number.

Patient Health and Service Utilization Outcomes

The study on training intensity for school counselors demonstrated that the more intense strategy, the CP-TF group, had better rated outcomes than the less intense strategy, the CP-BT group, for teacher-rated externalizing behaviors over time, child self-reported assaultive behaviors, and child-rated expectations of the utility of aggression (Table 24).⁸⁸

Table 24. Intensity of the strategy as a moderator of the effectiveness of the strategy: Summary of results (patient health and service utilization outcomes)

Study Design/Risk of Bias	Study Arms		Outcome Reported by Study and Time Period	Results
	Differences in Strategy Components Across Study Arms	N Analyzed		
Lochman et al., 2009 ⁸⁸	<p>G1: Professional training plus feedback to implement an EBP intervention (CP-TF)</p> <p>G2: Professional training only to implement an EBP intervention (CP-BT)</p> <p>G3: Control</p> <p>Difference across the three study arms varied: two strategy arms and one control arm—training plus feedback arm had all five components, training only arm had educational meetings and marketing components, and control arm had none of these components)</p>	<p>G1: 168</p> <p>G2: 183</p> <p>G3: 180</p>	<p>Mean change in teacher-rated externalizing behaviors over time</p> <p>Mean change in child self-reported assaultive behaviors</p> <p>Mean change for child-rated expectations of the utility of aggression</p>	<p>CP-TF=0, CP-BT=5, $X^2(1)=3.87$, $p=0.05$</p> <p>CP-TF=0.18, CP-BT=0.45, $X^2(1)=6.23$, $p=0.01$</p> <p>CP-TF=-0.1, CP-BT=0.1, $X^2(1)=5.64$, $p=0.02$</p>
Bickman et al., 2011 ¹³ RCT/High RoB	<p>G1: Weekly and cumulative 90-day feedback on patient symptoms and functioning to practitioners</p> <p>G2: Cumulative 90-day feedback on patient symptoms and functioning to practitioners only</p> <p>Single difference across arms: frequency of quality monitoring mechanism (weekly feedback to providers and cumulative 90-day feedback vs. 90-day feedback only) (comparison group strategy contained no components)</p>	<p>G1: 13 sites, 167 youths, 169 caregivers, 64 clinicians</p> <p>G2: 15 sites, 173 youths, 214 caregivers, 80 clinicians</p> <p>Total scales analyzed (breakdown by trial arm NR): youth, N=1,341; clinicians, N=1,291; caregivers, N=935</p>	<p>Youth</p> <p>Estimated coefficient of membership in feedback group at baseline</p> <p>Estimated coefficient of slope (time in weeks)</p> <p>Estimated coefficient of interaction of membership in feedback group and slope</p>	<p>0.02, SE: 0.10, $p>.005$</p> <p>-0.001, SE: 0.002, $p<.0001$</p> <p>-0.01, SE: 0.002, $p<.001$</p>

Table 24. Intensity of the strategy as a moderator of the effectiveness of the strategy: Summary of results (patient health and service utilization outcomes) (continued)

Study Design/Risk of Bias	Study Arms		Outcome Reported by Study and Time Period	Results
	Differences in Strategy Components Across Study Arms	N Analyzed		
Epstein et al., 2007 ⁸⁶	G1a: Patients whose physicians did conduct a titration trial as part of a collaborative consultative treatment service to promote the use of titration trials and periodic monitoring during medication management program G1b: Patients whose physicians did not conduct a titration trial as part of a collaborative consultative treatment service to promote the use of titration trials and periodic monitoring during medication management program	G1 (patients): 29 G1b (patients): 30 G2 (patients): 87	Mean scores for combined parent and teacher ratings of ADHD symptoms NR F score for strategy effect on combined parent and teacher ADHD ratings in subgroup of children who received a titration trial in G1 (compliers)	F4,124=3.80, p<0.01
	G2: Control All (both) components differed across arms (comparison group included neither of these components)		Reduction in DSM-IV symptomatology	G1a vs. G2: t114=-2.72, p=0.008, effect size=0.25 G1b vs. G2: t57= -3.568, p=0.001, effect size=0.47

ADHD = attention deficit hyperactivity disorder; CP-BT = Coping Power-Basic Training; CP-TF = Coping Power-Training plus Feedback; *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* (DSM-IV); G = group; N = number; NR = not reported; p = p-value; RCT = randomized controlled trial; RoB = risk of bias; SE = standard error.

The study on frequency of feedback to therapists found that effect sizes for symptoms and functional status increased by 50 percent for youth ratings of their own status, to 0.27, and by 66 percent for clinician reports, to 0.40 ($p<0.001$). The effect size did not increase for caregiver reports of adolescent functioning status.¹³

The study on using titration trials within a study of a collaborative consultative model found that patients whose physicians conducted a titration trial had lower combined parent and teacher ratings of ADHD symptoms but did not have an effect on DSM-IV rated symptomatology.⁸⁶

Conclusion and Strength of Evidence

We graded evidence from a single publication that presented data from a cluster RCT as having low strength of evidence for benefit that more intense treatment improved patient access to care and low strength of evidence for no benefit that more intensive treatment improved patient treatment engagement and practitioner protocol adherence/program fidelity in a strategy testing professional training plus feedback (to implement an EBP intervention) versus professional training only (to implement an EBP intervention) versus control (Table F-17). We also graded the strength of evidence as low for benefit that greater training intensity was associated with greater improvements in mental health symptoms (Table F-18). We graded the evidence from the other two publications that examined the moderating effect of training intensity as yielding insufficient strength of evidence for mental health symptoms and functional status.

Moderating Effects of Process Characteristics—Fidelity to EBP

Study Description

One study⁸⁴ (medium risk of bias) studied a P4P strategy to improve treatment implementation of an EBP for adolescent substance use disorders by comparing a P4P condition to an IAU control condition. The EBP implemented to be used by all therapists was the A-CRA; each organization received standardized funding, training, and coaching from the treatment developers. After finding a significant association between target A-CRA and remission status, the interaction between condition assignment and target A-CRA was examined with respect to patient remission status.

Patient Health and Service Utilization Outcomes

Fidelity to the EBP (i.e., meeting target A-CRA) did not significantly moderate the association between treatment group and patient remission status (Table 25).

Table 25. Intensity of the strategy as a moderator of the effectiveness of the strategy: Summary of results

Study Arms				
Study Design/Risk of Bias	Differences in Strategy Components Across Study Arms	N Analyzed	Outcome Reported by Study and Time Period	Results
Garner et al., 2012 ⁸⁴ RCT/RoB	G1: Paying practitioners for performance (P4P) for successfully delivering of an EBP intervention (A-CRA) G2: Implementation of an EBP intervention (A-CRA) as usual	G1: 14 organizations, 49 therapists G2: 15 organizations, 49 therapists	Patient health and service utilization outcomes: Mental health symptoms, syndromes, or disorders as measured by patient remission at 6-month followup	Fidelity did not moderate the association between treatment group and patient remission status (no effect sizes reported, $p=0.37$)

A-CRA = Adolescent Community Reinforcement Approach; EBP = evidence-based practice; G = group; N = number; RCT = randomized controlled trial; RoB = risk of bias; p = p-value; P4P = pay for performance.

Conclusion and Strength of Evidence

A single publication presented data from an RCT examining financial incentives provided to the practitioner for successful implementation of an EBT to treat adolescents with substance use disorders. We rated this study as having medium risk of bias. We graded the strength of evidence as low for no benefit: fidelity to the EBP did not moderate the effect of the strategy on patient remission (Table F-19).

Discussion

This section first summarizes key findings and strength of evidence for each Key Question (KQ). These sections are followed by discussions of limitations of the review, limitations of the evidence base, and gaps in the evidence that may benefit from future research, and by our overall conclusions.

Key Findings and Strength of Evidence

Key Question 1. Effectiveness of Strategies To Improve Mental Health Care for Children and Adolescents

Overview

The strategies included in this review were heterogeneous and difficult to categorize. We encountered a large degree of uncertainty and overlap when classifying the examined strategies as quality improvement (QI), implementation, and dissemination (our initial taxonomy). We then shifted to the Effective Practice and Organisation of Care (EPOC) taxonomy to identify individual components and groups of components.⁴³ This taxonomy allowed us to group strategies in two categories: (1) professional training strategies with professional components only or (2) financial or organizational change strategies with at least one financial or organizational component in addition to professional components. Most strategies were complex and included multiple (from two to seven) components.

Table 26 describes interventions and summarizes the evidence for included studies. We graded the strength of evidence of 28 outcomes for professional training strategies and of 19 for financial or organizational change strategies.

A majority of strategies had at least some evidence of effectiveness. Twelve studies demonstrated benefit; of these 11 had at least 1 outcome rated as low for benefit, and 1 study had a single outcome rated as moderate for benefit.

The strongest evidence in the review comes from a study of pay for performance. Therapists in the pay-for-performance group were more than twice as likely to demonstrate implementation competence as were the implementation-as-usual therapists (*moderate strength of evidence of benefit*).⁸⁴ Other outcomes for which we found evidence of benefit (*low strength of evidence of benefit*) included:

1. Improved practitioner adherence to evidence-based practice (EBPs) or guidelines from training practitioners to monitor metabolic markers,⁹⁵ providing computer decision support plus electronic health records (EHRs) that included diagnosis and treatment guidelines,⁸⁹ and offering an Internet portal for practitioner access to practice guidelines;⁸⁵
2. Improved practitioner morale, engagement, and stress from a program to improve organizational climate and culture;⁶⁷
3. Improved patient access to care, parent satisfaction, treatment engagement, and therapeutic alliance from training nurses to educate parents about EBPs;⁶⁶
4. Improved patient functional status from weekly feedback on patient symptoms and functioning to practitioners;¹³ and

Table 26. Strategies to improve mental health of children and adolescents: Summary table

Strategy, Study	Designs, N	Target Condition and Ages of Youth	Comparisons	Component of the Strategy	Major Findings	Strength of Evidence From Results	Reasons for Strength of Evidence
Training practitioners with or without feedback to implement an EBP Beidas et al., 2012 ⁸⁷	Cluster RCT, 115 therapists	Anxiety Ages 8–17 years	Augmented active learning vs. routine professional training workshop	Educational meetings or materials	No differences between arms for practitioner satisfaction with approach, protocol adherence, or practitioner skill	Low for no benefit for practitioner satisfaction, adherence, and skill	Low risk of bias, small sample size, imprecise results
			Computerized routine training vs. routine professional training workshop	Educational meetings or materials	No differences between arms for practitioner protocol adherence or program model fidelity, or skill; computerized training group practitioners less satisfied than routine training group practitioners	Low for no benefit for practitioner satisfaction, adherence, and skill	Low risk of bias, small sample size, imprecise results
Adding weekly feedback to practitioners regarding patient symptoms to practitioners Bickman et al., 2011 ¹³	Cluster RCT, N of clinicians unclear, 340 youth, 144 clinicians, 383 caregivers	General mental health problem (children who receive home-based mental health treatment) Mean age = 15 years	Weekly and cumulative 90-day feedback vs. cumulative 90-day feedback only on patient symptoms and functioning to practitioners	Audit and feedback	Two-thirds of practitioners did not view Web module	Insufficient for practitioner adherence	High study limitations, unknown precision for adherence
					Membership in the weekly feedback group increased the rate of decline in functional severity scale by 0.01 (range: 1 to 5, higher scores indicate greater severity)	Low for benefit for functional severity	High study limitations, precise results for symptoms

Table 26. Strategies to improve mental health of children and adolescents: Summary table (continued)

Strategy, Study	Designs, N	Target Condition and Ages of Youth	Comparisons	Component of the Strategy	Major Findings	Strength of Evidence From Results	Reasons for Strength of Evidence
Adding diagnosis and treatment guidelines to a computer decision support system Carroll et al., 2013 ⁸⁹	Cluster RCT, 84 patients	General mental health problem (children who receive home-based mental health treatment) Mean age = 15 years	Computer decision support plus electronic health record (EHR) that included diagnosis and treatment guidelines vs. computer decision support plus EHR only	Educational meetings or materials Patient-reported data Reminders Quality monitoring	Practitioner adherence improved through uptake of guidelines for diagnostic assessment (aOR, 8.0; 95% CI, 1.6 to 40.6); more reporting of 3 of 4 symptom domains at diagnosis	Low for benefit for practitioner adherence and program model fidelity	Medium study limitations, imprecise results with small number of events, large magnitude of effect
					No statistically significant differences on practitioner adherence through reassessment of symptoms at 3 months, adjustment of medications, and mental health referral	Insufficient for practitioner adherence (reassessment of symptoms) at 3 months, adjustment of medications, and referral	Medium study limitations, imprecise results (CIs cross the line of no difference)
					Visit to a mental health specialist calculated OR: 2.195; 95% CI, 0.909 to 5.303; p=0.081; reported p-value in study=0.054	Insufficient for service utilization	Medium study limitations, imprecise results (CIs cross the line of no difference)

Table 26. Strategies to improve mental health of children and adolescents: Summary table (continued)

Strategy, Study	Designs, N	Target Condition and Ages of Youth	Comparisons	Component of the Strategy	Major Findings	Strength of Evidence From Results	Reasons for Strength of Evidence
Providing practitioner access to practice guidelines via an Internet portal Epstein et al., 2011 ⁸⁵	Cluster RCT, 746 patients	Attention deficit hyperactivity disorder (ADHD) Ages 6 to 12 years	Internet portal providing practitioner access to practice guidelines vs. wait-list control	Educational meetings or materials Patient-reported data Audit and feedback Reminders Quality monitoring	Strategy appeared to improve 4 of 5 examined outcomes that measured practitioner protocol adherence and program model fidelity outcomes (mean change in proportion of patients who received targeted, evidence-based ADHD care outcomes between groups ranged from 16.6 to -50), but estimates were very imprecise, with large CIs	Low for benefit for practitioner protocol adherence and program model fidelity	Medium study limitations, imprecise (wide CIs)

Table 26. Strategies to improve mental health of children and adolescents: Summary table (continued)

Strategy, Study	Designs, N	Target Condition and Ages of Youth	Comparisons	Component of the Strategy	Major Findings	Strength of Evidence From Results	Reasons for Strength of Evidence
Collaborative consultation to promote the use of titration trials and periodic monitoring during medication management Epstein et al., 2007 ⁸⁶	Cluster RCT, 38 practitioners, 144 patients	ADHD Mean age = 7 years	Collaborative consultation treatment service to promote the use of titration trials and periodic monitoring during medication management vs. control	Audit and feedback Multidisciplinary team	Practitioner adherence/fidelity as measured by use of titration trials $\beta = -0.283$; SE, 0.09; $p < 0.01$ and by use of medication monitoring trials: $p = \text{NS}$, details NR	Insufficient for practitioner adherence and fidelity	High study limitations, imprecise results (small sample size)
					Lower odds with overlapping confidence intervals of practitioner citing obstacles to implementation of EBP in 6 of 8 measures (2 reached statistical significance)	Insufficient for practitioner competence/skills	High study limitations, imprecise results (small sample size)
					F score for decrease in combined parent and teacher ratings of ADHD symptoms for group x time interaction: $F_{2, 144} = 0.44$, $p = 0.65$	Insufficient for patient change in mental health symptoms	High study limitations, imprecise results (small sample size)

Table 26. Strategies to improve mental health of children and adolescents: Summary table (continued)

Strategy, Study	Designs, N	Target Condition and Ages of Youth	Comparisons	Component of the Strategy	Major Findings	Strength of Evidence From Results	Reasons for Strength of Evidence
Paying practitioners for performance in successfully implementing an EBP Garner et al., 2012 ⁸⁴	Cluster RCT, 49 therapists, 936 patients	Substance use disorders Mean age = 16 years	Paying practitioners for performance in successfully delivering an EBP intervention vs. implementation as usual	Provider incentives	Therapists in the P4P group were over twice as likely to demonstrate implementation competence compared with IAU therapists (Event Rate Ratio, 2.24; 95% CI, 1.12 to 4.48)	Moderate for benefit for practitioner competence	Medium study limitations, precise results
					Patients in the P4P condition were more than 5 times as likely to meet target implementation standards (i.e., to receive specific numbers of treatment procedures and sessions) than IAU patients (OR, 5.19; 95% CI, 1.53 to 17.62)	Low for benefit for practitioner adherence and program fidelity	Medium study limitations, imprecise results (wide CIs)
					No statistically significant differences between groups OR, 0.68; 95% CI, 0.35 to 1.33	Low for no benefit for patient change in mental health symptoms	Medium study limitations, precise results

Table 26. Strategies to improve mental health of children and adolescents: Summary table (continued)

Strategy, Study	Designs, N	Target Condition and Ages of Youth	Comparisons	Component of the Strategy	Major Findings	Strength of Evidence From Results	Reasons for Strength of Evidence
Program to improve organizational climate and culture Glisson et al., 2010 ^{14 a}	Two-stage RCT, 596 youth, 257 therapists	Externalizing behaviors (youth referred to juvenile court with behavioral or psychiatric symptoms that require intervention) Ages 9–17 years	Program to improve organizational climate and culture vs. usual care	Educational meetings or materials Educational outreach visits Provider satisfaction initiative Audit and feedback	Details NR but does not demonstrate improvements in any measure of adherence by strategy group for any ARC vs. no ARC comparison Difference in out-of-home placements and child behavior problem scores at 18 months between ARC-only and usual-care groups did not meet statistical significance ($p=0.05$).	Low for no benefit for practitioner adherence Low for no benefit for patient change in mental health symptoms at 18 months	Medium study limitations, precise results Medium study limitations, precise results (small sample size), CIs likely overlap
Program to improve organizational climate and culture Glisson et al., 2012 ^{67,68}	Cluster RCT 352 caregivers of youth ages 5–18 in 18 programs	General mental health problems Ages 8–24 years	Program to improve organizational climate and culture vs. usual care	Educational meetings or materials Educational outreach visits Provider satisfaction initiative Audit and feedback	Trends toward improvement in all domains; nonoverlapping CI for some domains showing significant improvements ($p<0.05$) for ARC group vs. usual care Lower problem behavior scores for youth in the ARC group compared with those in the control group during first 6 months of followup (following 18-month organizational implementation), effect size=0.29	Low for benefit for practitioner satisfaction Low for benefit for patient change in mental health symptoms	Medium study limitations, imprecise results (small study sample) Medium study limitations, imprecise results (small study sample)

Table 26. Strategies to improve mental health of children and adolescents: Summary table (continued)

Strategy, Study	Designs, N	Target Condition and Ages of Youth	Comparisons	Component of the Strategy	Major Findings	Strength of Evidence From Results	Reasons for Strength of Evidence
Training nurses to educate parents about EBPs Gully et al., 2008 ⁶⁶	Interrupted time series in Study 1, 172 parents or caregivers; RCT in Study 2, 51 parents or caregivers	General mental health symptoms (children suspected of abuse during forensic medical examinations) Ages 2–17 years	Protocol to train nurses to educate parents about EBPs vs. typical services	Educational meetings or materials Educational outreach visits Patient-reported data	Strategy improved parent ratings of access to care (mean difference between groups ranged from 0.08 to 2.1 points in Study 1 and 0.6 to 1.9 in Study 2) (scale=1–5)	Low for benefit for patient access to care	High risk of bias, consistent, direct, precise results
					Improved parent ratings of satisfaction of care by a mean of 0.4 in Study 1 and 0.9 in Study 2 (scale=1–5)	Low for benefit for patient satisfaction	High risk of bias, consistent, direct, precise results
					Improved parent ratings of treatment engagement by a mean of 0.9 in Study 1 and 2.5 in Study 2 (scale=1–5)	Low for benefit for treatment engagement	High risk of bias, consistent, direct, precise results
					Improved parent ratings of therapeutic alliance by a mean of 0.4 in Study 1 and 0.9 in Study 2 (scale=1–5)	Low for benefit for therapeutic alliance	High risk of bias, consistent, direct, precise results

Table 26. Strategies to improve mental health of children and adolescents: Summary table (continued)

Strategy, Study	Designs, N	Target Condition and Ages of Youth	Comparisons	Component of the Strategy	Major Findings	Strength of Evidence From Results	Reasons for Strength of Evidence
Adding intensive quality assurance to implement an EBP Henggeler et al., 2008 ⁹³	Controlled clinical trial, 30 practitioners, N of caregiver and patient reports and monthly data points NR	Substance use disorders (adolescents with marijuana abuse) Ages 12–17 years	Intensive Quality Assurance (IQA) system vs. workshop only to implement an EBP intervention	Quality monitoring	Study does not provide sufficient detail to judge magnitude of effect on practitioner adherence to cognitive behavioral therapy and monitoring techniques	Insufficient for practitioner adherence and fidelity	High study limitations, imprecise results
Adding computer-assisted training with or without ongoing supervision and coaching to practitioners implementing an EBP Henggeler et al., 2013 ⁹¹	Cluster RCT; 161 therapists	Substance use disorders Ages 12–17 years	Workshop and resources (WSR) vs. WSR and computer-assisted training (WSR+CAT) to implement an EBP intervention	Educational meetings or materials	No statistically significant difference between groups for use, knowledge, and adherence	Insufficient for additional benefit of WSR+CAT vs. WSR comparison group for practitioner use, knowledge, and adherence	Medium study limitations, imprecise, small sample sizes, cannot determine whether CIs cross line of no difference
			WSR vs. WSR+CAT and supervisory support (WSR+CAT+SS) to implement an EBP intervention	Educational meetings or materials Educational outreach visits	No statistically significant difference between groups for use, knowledge, and adherence	Insufficient for additional benefit of WSR+CAT+SS vs. WSR comparison group on practitioner use, knowledge, and adherence competence/skills	Medium study limitations, imprecise, small sample sizes, cannot determine if CIs cross line of no difference

Table 26. Strategies to improve mental health of children and adolescents: Summary table (continued)

Strategy, Study	Designs, N	Target Condition and Ages of Youth	Comparisons	Component of the Strategy	Major Findings	Strength of Evidence From Results	Reasons for Strength of Evidence
Training practitioners to identify and refer cases Lester et al., 2009 ⁹⁰	Cluster RCT; 110 practices, 179 patients	Psychosis (adolescents and adults with first-episode psychosis) Ages 14–30 years	Professional training to identify and refer cases vs. usual care	Educational meetings or materials	Relative risk (RR) of referral to early intervention after first contact: 1.20, 95% CI, 0.74 to 1.95, p=0.48	Insufficient for patient access to care	High study limitations, imprecise results
				Educational outreach visits	No statistically significant differences between groups in changes in patient mental health status	Insufficient for patient change in mental health symptoms	High study limitations, imprecise results
					Patients in the professional training group averaged 223.8 fewer days for time from the first decision to seek care to the point of referral to an early intervention service than patients in the control group	Low for benefit for service utilization	High study limitations, imprecise results
					No adverse events were reported, no significant between-group differences for false-positive referral rates from primary care	Insufficient for patient harms	High study limitations, unknown precision

Table 26. Strategies to improve mental health of children and adolescents: Summary table (continued)

Strategy, Study	Designs, N	Target Condition and Ages of Youth	Comparisons	Component of the Strategy	Major Findings	Strength of Evidence From Results	Reasons for Strength of Evidence
Training practitioners with and without feedback to implement an EBP Lochman et al., 2009 ⁸⁸	Cluster RCT, 511 patients	Externalizing behaviors (children at risk for aggressive behaviors) Ages: third-grade students	Professional training plus feedback (CP-TF) to implement an EBP intervention vs. control	Educational meetings or materials Audit and feedback	Students in CP-TF group had fewer behavioral problems as rated by teachers (beta=-0.41, SE=0.16, p=0.01) than controls but no significant difference in teacher ratings or parent ratings	Low for no benefit for changes in mental health status	Medium study limitations, precise results
					Students in CP-TF group had fewer minor assaults (e.g., hitting or threatening to hit a parent, school staff, or student) as reported by the child (beta=-0.25, SE=0.12, p=0.03) and social/academic competence as reported by the teacher (beta=0.35, SE=0.13, p=0.01) compared with controls	Low for benefit for change in socialization skills and behaviors	Medium study limitations, precise results

Table 26. Strategies to improve mental health of children and adolescents: Summary table (continued)

Strategy, Study	Designs, N	Target Condition and Ages of Youth	Comparisons	Component of the Strategy	Major Findings	Strength of Evidence From Results	Reasons for Strength of Evidence
			Professional training only to implement an EBP intervention (CF-BT) vs. control	Educational meetings or materials	No significant difference in behavioral problems as rated by teachers or parents or student-reported assaults between CP-BT and control groups	Low for no benefit for changes in mental health status	Medium study limitations, precise results
					No significant differences in social/academic competence as reported by the teacher, nor were any significant differences found between groups on social skills as rated by parents.	Low for no benefit for change in socialization skills and behaviors	Medium study limitations, precise results

Table 26. Strategies to improve mental health of children and adolescents: Summary table (continued)

Strategy, Study	Designs, N	Target Condition and Ages of Youth	Comparisons	Component of the Strategy	Major Findings	Strength of Evidence From Results	Reasons for Strength of Evidence
Training practitioners to use a patient medication monitoring program	Interrupted time series	Psychosis Ages <19 years (mean age = 11)	Patient medication monitoring training program for practitioners vs. usual care	Educational meetings or materials	38.3% of patients had a metabolic monitoring and documentation tool (MMT) in the charts after program implementation; drop in the prevalence of second-generation antipsychotic prescribing from 15.4% in the pre-metabolic monitoring training program (MMTP) period to 6.4% in the post-MMTP period (p<0.001)	Low for benefit for practitioner adherence	High study limitations, precise outcomes
Ronsley et al., 2012 ⁹⁵	Health care practitioners for 2,376 patients			Educational outreach visits			
				Reminders			
					Increased metabolic monitoring over time (level of change varied by type of monitoring)	Low for benefit for patient service utilization	High study limitations, precise outcomes

Table 26. Strategies to improve mental health of children and adolescents: Summary table (continued)

Strategy, Study	Designs, N	Target Condition and Ages of Youth	Comparisons	Component of the Strategy	Major Findings	Strength of Evidence From Results	Reasons for Strength of Evidence
Embedding a behavioral health care practitioner in primary care Sterling et al., 2015, ⁹²	Cluster RCT, 47 pediatricians with 1,871 eligible patients	Varied conditions among children attending a pediatric primary care office Ages 12–18	Pediatrician only vs. embedded behavioral health care practitioner (BHCP) implementation of an EBP	Multidisciplinary teams	No significant differences in substance use assessment between study arms (aOR, 0.93; 95% CI, 0.72 to 1.21); patients in the embedded BHCP group more likely than those in the pediatrician-only group to receive brief intervention (aOR=1.74, 95%CI, 1.31 to 2.31); patients in the BHCP group less likely to receive a referral to a specialist than patients in the primary-care- ^b only group (aOR=0.58, 95%CI, 0.43 to 0.78)	Low for no benefit for adherence (2 of 3 adherence outcomes were statistically significant)	Medium study limitations, unable to assess precision

Table 26. Strategies to improve mental health of children and adolescents: Summary table (continued)

Strategy, Study	Designs, N	Target Condition and Ages of Youth	Comparisons	Component of the Strategy	Major Findings	Strength of Evidence From Results	Reasons for Strength of Evidence
Colocating an EBP program in primary care	Controlled clinical trial, 4 pediatric practices, 20,917 children with primary care visit	Externalizing behavior problems Ages 2–12 years	Colocation of a behavioral health EBP parenting program in primary care vs. enhanced referral to a behavioral health EBP parenting program in a location external to the practice.	Changing the scope of benefits	OR for attending first EBP visit, 3.10; 95% CI, 1.63 to 5.89	Low for benefit for patient access to care	High study limitations, precise results
Wildman et al., 2009 ⁹⁴					No improvement in mean number of sessions attended (calculated mean difference: -1.01; 95% CI, -2.60 to 0.58)	Insufficient for patient service utilization	High study limitations, precise results

^a Four study groups were examined: ARC+MST, ARC only, MST only, and usual care. Comparisons were ARC only vs. usual care or any ARC (combined ARC+MST and ARC only) vs. no ARC (combined MST and usual care), as noted.

^b Fewer referrals seen as improvement because this outcome indicates that the practitioner was able to give brief intervention without referral to behavioral health specialists.

ADHD = attention deficit hyperactivity disorder; aOR = adjusted odds ratio; ARC = Availability, Responsiveness and Continuity; CBT = cognitive behavioral therapy; CI = confidence interval; CP-TF = Coping Power training plus feedback; EBP = evidence-based practice; EHR = electronic health record; IAU = implementation as usual; IQA = Intensive Quality Assurance; MMT = metabolic monitoring program; MMTP = metabolic monitoring training program; MST = multisystemic therapy; N = number; NR = not reported; NS = not significant; OR = odds ratio; p = probability; RCT = randomized controlled trial; RR = relative risk; P4P = pay for performance; SE = standard error; WSR = workshop plus resources; WSR+CAT = workshop plus resources plus computer-assisted training; WSR+CAT+SS = workshop plus resources plus computer-assisted training plus supervisory support.

5. Improved service utilization from training practitioners about monitoring medications⁹⁵ and appropriately identifying and referring patients.⁹⁰

Only four strategies (1 one study each) consistently provided *insufficient or evidence of no benefit* across all reported outcomes. These included:

1. A strategy testing augmented active learning versus computerized routine learning versus routine practitioner workshop to implement an EBP,⁸⁷
2. A collaborative consultation treatment service to promote the use of titration trials and periodic monitoring during medication management versus control,⁸⁶
3. An Intensive Quality Assurance system versus a workshop to implement an EBP intervention,⁹³ and
4. Use of additional computerized-assisted training or computerized training plus supervisory support to implement an EBP versus using a workshop and resources only.⁹¹

The studies varied with respect to the numbers and types of active components; i.e., we observed considerable differences in components in treatment group strategies and comparison group strategies. In some studies, the treatment group contained several components and the comparison group contained none of those components. In other studies, both the treatment and comparison groups tested strategies with multiple components, with varying numbers of differences in components across arms. Because both arms often received active interventions, the Hawthorne effect may explain lack of effectiveness. We did not find any consistent patterns of effectiveness involving the number of active components. That is, we did not find that studies that employed strategies with a single active component had any better or any worse effect on outcomes than those that employed multiple active components.

Additional heterogeneity arose from several other sources and precluded any quantitative synthesis of our findings. Except for two studies reported in one publication⁶⁶ and two trials (three publications) reporting variants of a similar intervention,^{14,67,68} none of the other studies tested similar strategies. The outcomes of the studies varied widely. Similarly, settings differed greatly (community-based hospitals and clinics, general practice and primary care, home-based mental health systems, schools). Finally, the targets of each strategy, such as practitioners, practices, or systems, also differed considerably.

The absence of evidence on several factors of interest further limited our conclusions. We found no evidence of studies examining several intermediate outcomes, particularly system-level intermediate outcomes. We also identified no studies that measured final patient health outcomes such as co-occurring conditions or mortality. We also found no evidence of strategies testing several components of the EPOC taxonomy, including any regulatory components, and little evidence on strategies with financial components.

Of the 17 studies in our review, one study had low risk of bias and three had medium risk of bias. We rated seven as having unclear risk of bias and six as having high risk of bias. Various issues with study design, attrition, and incomplete information reported by study authors precluded most of these studies from having a low or medium risk of bias.

The uncertain or high risk of bias of most of these studies affected the overall strength of evidence grades, as did the fact that we mainly had only single studies for each strategy examined.

Key Question 2. Harms Associated With Strategies To Improve Mental Health Care for Children and Adolescents

Only one study evaluated the harms associated with strategies to improve mental health care for children and adolescents (Table 27). We graded the strength of evidence as insufficient for harms associated with a professional training strategy to improve access to early intervention for adolescents and young adults with psychosis. The study reported no adverse events or between-group differences in false-positive referrals from primary care to early-intervention services. Of note, no other studies reported on any of the harms we identified a priori for patients, providers, or organizations (Table 28).

Table 27. Summary of evidence of harms associated with strategies to improve mental health care among children and adolescents (Key Question 2)

Outcome Category, Outcome Number of Studies; n of Individuals Results	Active Strategy Component	Strength of Evidence (Domain-Specific Ratings)
Patient: Adverse events 1 RCT; 110 practices, 79 patients ⁹⁰ No adverse events reported.	Educational meetings, local consensus process, educational outreach visits, marketing	Insufficient for professional training to identify and refer cases vs. treatment as usual (high study limitations, imprecise results)
Patient: False-positive referrals 1 RCT; 110 practices, 79 patients ⁹⁰ No between-group differences in false-positive referrals from primary care to early-intervention services	Educational meetings, local consensus process, educational outreach visits, marketing	Insufficient for professional training to identify and refer cases vs. treatment as usual (high study limitations, imprecise results)

RCT=randomized controlled trial; vs. = versus.

Table 28. Evidence about harms (Key Question 2)

A Priori Harms	Evidence Identified in the Review
Patient	
Lower treatment engagement or increased dropouts (or both)	None
Negative impact on therapeutic relationship	None
Side effects of an evidence-based practice incorporated into strategy (e.g., adverse events, suicidality)	1 study (adverse events, false-positive referrals from primary care to early-intervention services)
Patient dissatisfaction with care	None
Provider	
Burnout or exhaustion	None
Turnover	None
Resistance to strategy	None
Organization	
Cost	None
Failure to sustain evidence-based practice	None
Resistance to change	None
Resistance to strategy	None

Key Question 3. Moderators of the Effectiveness of Strategies To Improve Mental Health Care for Children and Adolescents

Overall, we found evidence on four strategies that examined moderators of the effectiveness of strategies to improve mental health care for children and adolescents (Table 29). Three

examined whether training intensity influenced the degree of effectiveness; of these, two strategies were graded as having insufficient strength of evidence. The third strategy had low strength of evidence for benefit for patient intermediate outcomes (access to care) and patient health and service utilization outcomes (change in mental health status).

Table 29. Moderators of the effectiveness of strategies to improve mental health care among children and adolescents (Key Question 3)

Moderator	Outcome Category, Outcome Number of Studies; n of Individuals	Active Strategy Component	Strength of Evidence (Domain-Specific Ratings)
Training intensity Patient: Patient access to care	1 RCT; 110 practices, 79 patients ⁸⁸	<i>Professional training plus feedback:</i> Educational training, educational meetings, educational outreach visits, marketing, and online access and project coordinator	Low for benefit for moderating effect of training intensity on professional training plus feedback to implement an EBP intervention vs. professional training only to implement an EBP intervention vs. control (medium study limitations, precise results)
More intensive training improved access to care ratings (sessions scheduled) for both children and parents.		<i>Professional training only:</i> Educational meetings and marketing	
Training intensity Patient: Treatment engagement	1 RCT; 110 practices, 79 patients ⁸⁸	<i>Professional training plus feedback:</i> Educational training, educational meetings, educational outreach visits, marketing, and online access and project coordinator	Low for no benefit for moderating effect of training intensity on professional training plus feedback to implement an EBP intervention vs. professional training only to implement an EBP intervention vs. control (medium study limitations, precise results)
Groups did not differ significantly.		<i>Professional training only:</i> Educational meetings and marketing	
Training intensity Practitioner: Protocol adherence/program fidelity	1 RCT; 110 practices, 79 patients ⁸⁸	<i>Professional training plus feedback:</i> Educational training, educational meetings, educational outreach visits, marketing, and online access and project coordinator	Low for no benefit for moderating effect of training intensity on professional training plus feedback to implement an EBP intervention vs. professional training only to implement an EBP intervention vs. control (medium study limitations, precise results)
Groups did not differ significantly.		<i>Professional training only:</i> Educational meetings and marketing	
Training intensity Patient health and service utilization: Mental health symptoms	1 RCT; 511 patients ⁸⁸	<i>Professional training plus feedback:</i> Educational training, educational meetings, educational outreach visits, marketing, and online access and project coordinator	Low for benefit for moderating effect of training intensity on professional training plus feedback to implement an EBP intervention vs. professional training only to implement an EBP intervention vs. control (medium study limitations, precise results)
More intensive training was associated with greater improvements in mental health symptoms.		<i>Professional training only:</i> Educational meetings and marketing	
Training intensity Patient health and service utilization: Mental health symptoms	1 RCT; N of practitioners unclear ¹³	Weekly feedback to providers and cumulative 90-day feedback vs. 90-day feedback only	Insufficient for moderating effect of training intensity on weekly and cumulative 90-day feedback vs. cumulative 90-day feedback only on patient symptoms and functioning to practitioners (high study limitations, unknown precision)
Effect sizes for child and parent ratings of symptoms improved significantly in the more intensive training group.			

Table 29. Moderators of the effectiveness of strategies to improve mental health care among children and adolescents (Key Question 3) (continued)

Moderator	Active Strategy Component	Strength of Evidence (Domain-Specific Ratings)
Outcome Category, Outcome Number of Studies; n of Individuals Results Training intensity Patient health and service utilization: Mental health symptoms 1 RCT; 197 practitioners in 26 programs ⁸⁶ Reduction in mental health symptoms in the compliers group was significantly greater than that seen in the control group ($t(114)=-2.72$, $p=0.008$, effect size=0.25) and in the noncomplier group ($t(57)=-3.568$, $p=0.001$, effect size=0.47).	Audit and feedback and clinical multidisciplinary teams	Insufficient for moderating effect of training intensity on collaborative consultation treatment service to promote the use of titration trials and periodic monitoring during medication management vs. control (high study limitations, imprecise results [small sample size])
Training intensity Patient health and service utilization: Functional status 1 RCT; 49 therapists and 936 patients ⁸⁴ Fidelity to EBP (meeting target A-CRA) had no effect on the association between treatment group and patient remission status.	Provider incentives	Low for no benefit for moderating effect of fidelity to EBPs on paying practitioners for performance in successfully delivering an EBP intervention vs. IAU (medium study limitations, precise results)
Training intensity Patient health and service utilization: Functional status 1 RCT; N of practitioners unclear ¹³ Effect sizes for child and parent ratings of functional status improved significantly in the more intensive training group	Weekly feedback to providers and cumulative 90-day feedback versus 90-day feedback only	Insufficient for moderating effect of training intensity on weekly and cumulative 90-day feedback vs. cumulative 90-day feedback only on patient symptoms and functioning to practitioners (high study limitations, unknown precision)

A-CRA = Adolescent Community Reinforcement Approach; EBP = evidence-based practice; IAU = implementation as usual; N or n = number; NA = not available; RCT = randomized controlled trial.

Therapists receiving more intensive training had greater improvements in ratings of patient access to care (sessions scheduled) for both children and parents and greater improvements in patients' mental health symptoms (i.e., less externalizing behaviors) than therapists receiving less intensive training. We were unable to combine the findings from these studies because of the heterogeneity in the strategies being tested.

A fourth study examined the moderating effects of fidelity to the EBP (meeting target Adolescent Community Reinforcement Approach [A-CRA]) used as part of the strategy. We graded the strength of evidence as low for no benefit for moderating the effect of the strategy, patient health outcome, and patient remission status.

We did not find studies that examined most of our previously-specified list of moderators such as patient characteristics, intervention characteristics other than training intensity, factors of the outer or inner setting/organizational factors, characteristics of involved individuals, process characteristics other than fidelity to the training, or other moderators such as length of followup (Table 30).

Table 30. Evidence about moderators

A Priori Harms Outcomes	Evidence Identified in the Review
Patient characteristics (age, gender, cognitive functioning, diagnosis/severity of mental health problem, comorbid conditions, cotreatments, race/ethnicity)	None
Intervention characteristics (complexity, manualized or not, intensity/frequency/duration, adjustment of intervention to fit context)	3 studies (intensity only)
Outer setting (external policy, incentives, availability of alternative care systems)	None
Inner setting/organizational factors (type of outpatient setting, structure/size, culture, implementation climate, readiness of organization for implementation)	None
Characteristics of involved individuals (provider type, knowledge, beliefs, self-efficacy, leadership, education, certifications, accreditation policies, standards, and years of practice)	None
Process characteristics (fidelity to the planned strategy, fidelity to the EBP, use of champions or supervision/oversight)	1 study (fidelity to the EBP only)
Other: Length of followup	None

EBP = evidence-based practice.

Finding Solutions for Success

We employed qualitative comparative analysis (QCA) to understand what intervention components were present in successful strategies. We found seven solutions or recipes (with perfect consistency (i.e., each solution always resulted in success) that accounted for 10 of the 12 cases that demonstrated either improvements in a majority of practitioner-, system-, or patient-level intermediate outcomes tested *or* at least low strength of evidence for benefit of at least one patient health or service utilization outcome (i.e., 83% total coverage).

The seven solutions included: (1) a financial incentive, (2) a change in the scope of patient benefits, (3) use of a clinical multidisciplinary team without an audit and feedback component, (4) use of educational materials or meetings plus educational outreach and reminders, (5) use of educational materials or meetings plus patient-mediated interventions plus reminders, (6) use of educational materials or meetings plus patient-mediated interventions plus educational outreach, or (7) use of audit and feedback without an educational outreach component and without a clinical multidisciplinary team component. This last solution is unusual because the absence of components are necessary parts of the recipe for success. We cannot explain why the absence of educational outreach components are part of the seventh solution.

Closer examination of each of these solutions sheds light on successful strategies. For solution 1 above, the Garner et al. study indicated that provider financial incentives, i.e., paying practitioners for successfully implementing an EBP, improved outcomes.⁸⁴ The Wildman et al. study (solution 2) assigned primary care pediatric practices to co-located behavioral parent training to make referrals to behavioral health care providers easier.⁹⁴ Looking at solutions 3 and 7 together (four studies), we found that strategies that contained audit and feedback *or* used clinical multidisciplinary teams, but that did not have both components, had beneficial outcomes, although the combination of audit and feedback plus no use of clinical multidisciplinary teams also required *not* having an educational outreach component). The single study in solution 3 (clinical multidisciplinary teams and *no* audit and feedback), by Sterling and colleagues,⁹² determined that using an embedded behavioral health care practitioner (BHCP) to implement an EBP led to better patient adherence outcomes than using only a primary care provider to implement an EBP. The three studies in solution 7 consisted of having an audit and feedback component, but *no* clinical multidisciplinary teams and *no* educational outreach. The Bickman

study¹³ examined the addition of weekly feedback on patient symptoms and functioning to usual cumulative 90-day feedback received by practitioners; the Lochman study⁸⁸ tested the use of professional training plus feedback to implement an EBP intervention; and the 2011 Epstein study⁸⁵ examined the use of an Internet portal to provide practitioner access to practice guidelines. Solutions 4, 5, and 6 revealed that a mix of educational materials or meetings plus at least two other professional components (including either educational outreach, patient-mediated interventions, or reminders) produced beneficial outcomes.

Findings in Relationship to What Is Already Known

This systematic review contributes to the literature on QI, implementation, and dissemination strategies targeting systems and organizations or practitioners of mental health care to children and adolescents. Our review updates the literature while simultaneously targeting especially critical aspects of mental health issues for children and adolescents.

First, we included studies published through January 14, 2016. Two recent systematic reviews had already addressed this topic but stopped short of 2012. Barwick et al. (2012)³⁸ examined 12 studies of knowledge translation interventions and strategies related to the delivery, organization, or receipt of child and youth mental health services that had been published between 2001 and 2009.³⁸ All 12 studies reported statistically significant changes in behaviors from knowledge translation, although the quality of studies was limited by insufficient or unclear reporting and small sample sizes. The authors also noted that the behaviors were largely self-reported rather than observed, and several studies involved simulated situations rather than real-world settings. Novins et al. in 2013 examined studies of dissemination and implementation EBPs for managing patients with mental health or substance abuse problems that had been published between 1991 and December 2011.³⁹ These authors reported that a majority of the included articles were observational rather than experimental and that the strongest empirical evidence existed for fidelity monitoring and supervision. Both prior reviews called for additional studies on these topics because of the dearth of sufficient evidence in this field.

Second, our inclusion criteria were narrower than those in the earlier reviews. Both previous reviews had included studies that focused on teacher training for behavior change; by contrast, we focused primarily on mental health practitioners. In addition, our review focused on strategies for a relatively narrower mental health population. For example, we excluded studies about children with developmental disabilities, including autism, because of the heterogeneity in strategies used and types of systems involved in their care; the Barwick et al. review had included studies in which the primary mental health population had been diagnosed with autism. We also examined only studies of youth with mental health symptoms; we excluded prevention studies focused on populations not currently experiencing mental health symptoms. Novins et al. had included several preventative studies such as those in a child welfare setting, where presumably many of the children were at risk for developing mental health symptoms. Barwick et al. excluded studies of children with substance abuse; by contrast, like Novins et al., we included studies of youth with substance abuse as the primary diagnosis. The age range of the targeted mental health populations also differed between this review and prior reviews. Barwick et al. had defined youth more broadly, including studies with youth up to age 24 years. Our study focused on studies examining samples primarily comprising children through 18 years of age.

With respect to study design, of the 17 studies identified in our review, 13 were RCTs. Two studies were clinical controlled trials; one was an interrupted time series design; and one was cohort study with a historical control. Barwick et al. also had included studies with quasi-

experimental designs (n=4); Novins et al.'s review was even broader in scope, including descriptive and qualitative studies.

Third, our review included a broader range of strategies. We reviewed (a) implementation strategies used to adopt and integrate EBPs into routine care and (b) dissemination strategies used to make evidence more easily available through increasing access to EBPs or raising people's motivation or ability to use and apply EBPs. We also attempted to include only studies for which we could distinguish the effects of the strategy of interest from the underlying EBP. In addition, we also examined QI strategies, which had not been explicitly included in the prior systematic reviews. Our study also highlighted the overlap between the definition of QI and the concepts used in studies of implementation or dissemination (or both).

Fourth, unlike other reviews, we attempted to understand the moderating effects of different variables on effectiveness or harms. Moderators of interest included the following: (a) patient characteristics such as age, gender, race, cognitive ability, diagnosis, severity, coexisting conditions and cointerventions; and (b) intervention characteristics, such as complexity, manualized or not, intensity, frequency, and duration. Little evidence is available about the influence of these types of sociodemographic, health, or program factors, which emphasized the need for future studies to examine such variables explicitly.

The two prior reviews and our review each concluded that some evidence of efficacy of these strategies can be found, however, the field is new and additional research is needed to help translate research into practice. Nevertheless, the field was and remains too new to draw definitive conclusions, and all three reviews agree that additional research is needed. Such research should include well-designed studies with better and more complete reporting of methods.

Numerous well-designed clinical trials of mental health interventions for youth exist, of course. Nonetheless, knowledge of how to best implement and disseminate these interventions remains limited for at least three principal reasons. One is simply the limited number of studies of strategies conducted to date; another is the high risk of bias in the studies that we identified and included; and the third is the overall weak strength of evidence, particularly for benefits.

Applicability

Population

The studies in this review focused on strategies to improve care for children with mental health and substance abuse problems. Investigations involving children with developmental disorders, such as autism and learning disabilities, were excluded because such patients are often treated through different service systems than child mental health. Most studies (13) involved mental health disorders; 4 additional studies focused on substance use disorders. Ages of patients in these studies ranged mainly from 2 years to 18 years. In addition, two studies that focused on psychosis also included young adults because this is the age of first incidence of psychosis in most cases. Because the majority of studies employed cluster randomization techniques, they generally did not restrict eligible patients to a narrow spectrum of disorder; patients are generally representative of larger populations.

Providers of the target strategies were clinicians with various types of health professional training (e.g., psychiatrists, psychologists, and nurses). Studies that focused on strategies delivered by professionals outside the health field, such as teachers, were excluded. Providers and health care systems featured in the studies included in this review were representative of

those delivering care in the community: all studies describe community practitioners, primary care clinics, or public-sector health care providers.

In sum, these findings apply to professionally trained health practitioners who treat children and adolescents with mental health or substance use disorders (or both).

Interventions and Comparators

This review included QI, implementation, and dissemination strategies delivered by practitioners in typical outpatient settings. All strategies reviewed were aimed at health practitioners (e.g., training them) or at settings or systems (e.g., implementing a new medical management system). Studies generally adopted a multipronged effort, often requiring changes in behavior or process for many different participants in the health care delivery process. Although the time commitment and intensity of these strategies varied substantially, the nature of this review is such that all included strategies require at least some degree of structural change. These findings may best apply to systems of care that have some degree of internal control to be able to adopt and enforce change.

In over half the studies, investigators described the comparison arm as care as usual and did not report any specific strategies employed in the comparison arms. The other studies compared a more intense intervention with a less intense intervention. Because “care as usual” can vary substantially, we cannot comment on whether comparisons (whether characterized as “care as usual” or a “less intense intervention”) fully represent the array of current practice.

Most authors did not report or respond to queries about the availability of their materials for replication (Appendix G). A small minority reported that materials were available on a public Web site. Without easily accessible replication materials, the resource implications of adopting strategies in other settings are unknown.

Outcomes

Because study investigators examined a limited number of moderators and outcomes, the applicability of these findings and the transportability of these strategies to other settings remain unknown. Only one study examined system uptake; no other system intermediate outcomes such as feasibility, timeliness, penetration, sustainability, and resources (including costs) were explored. With respect to harms, only one study examined such a study result—in this case, patient side effects associated with a tested strategy. Four studies examined “moderators,” namely, training intensity or fidelity to protocol (or both).

Thus, our findings reflect information chiefly about possible positive effects of the various strategies, virtually nothing about the possible negative effects of such strategies, and extremely little or nothing about factors that might moderate or enhance such effects (such as characteristics of patients or clinicians, length of followup, or other components of the interventions or the study designs).

Settings

Included studies had been set in schools, mental health clinics, and primary care practices. In general, studies testing the implementation of an EBP did so in these typical care settings. Other than two studies set in the United Kingdom and Canada, all others were set in the United States. KQ 1 results did not vary noticeably across settings. KQ 2 findings on the risk for inappropriate referral from primary care¹¹³ may be more applicable for primary care settings than for, say,

schools or clinics. One study measured the impact of placing behavioral health care in a larger health-based care system on patients' or parents' access to evidence-based care. Such colocation may increase access to effective child mental health services. For many health care systems, this may be an achievable, structural change that, once in place, could have lasting impact. By and large, our findings are pertinent for most settings in the United States in which this type of care for these populations would be rendered.

Implications for Clinical and Policy Decisionmaking

This body of evidence is relatively recent and small, often consisting of a single study each on multiple and diverse clinical areas and intervention strategies within child mental health. Across included studies, the strength of evidence for any intermediate outcome was rated moderate in one instance and low or insufficient for the remainder. We did not find moderate strength of evidence for any patient health and service utilization outcomes (system or patient level).

For providers or health care organizations looking for an evidence basis for deciding whether to support or expand QI, implementation, or dissemination strategies, our findings suggest (1) some confidence that provider financial incentives can improve competence in implementing EBPs; (2) weak confidence that strategies with educational meetings, materials, and outreach programs can be successful in combination with reminders or providing practitioners with newly collected clinical information in improving intermediate or health outcomes; and (3) weak confidence that educational materials or meetings (or both) or only educational materials and outreach components do *not* improve intermediate or health outcomes. Funders may be particularly interested in our findings of low or insufficient evidence as potential areas to fund new research.

The overall lack of strong evidence needs to be interpreted in the context of the general development of research in children and adolescent health care. Even in arguably more mature QI research areas among children and adolescents such as intensive care, infectious disease, and pulmonary disease, QI strategies can change provider behavior but system- and patient-level changes may be difficult to demonstrate. For example, Okelo et al. published a large review of 68 QI strategy studies that all aimed to improve provider adherence to evidence-based asthma protocols. These authors found notably more evidence for changing process outcomes than for changing patient-level outcomes.¹¹⁴

Furthermore, mental health research, especially for children and adolescents, poses notably greater challenges than the rest of health care for a variety of complex reasons (e.g., barriers in studying children; the difficulty of studying brain and behavior; stigma, low levels of research funding; complications of long-term followup as children age). It follows that QI research, at least for these populations, might well lag some other fields of investigation in depth, breadth, or robustness.

Given the paucity of evidence for strategies for improving mental health in children, a question that arises is whether QI, implementation, or dissemination strategies that have been tested and then reported in the adult literature might apply to children. The clinical and social context of child mental health can be very different from that of adults. Attributes specific to children such as their dependence on adult caregivers, the primacy of school environments, treatment needs, and diagnoses (e.g., attention deficit disorder, conduct disorder, oppositional defiant disorder, developmental disabilities) result in tailored responses from providers and organizations. Nonetheless, evidence on strategies that are somewhat removed from the clinical

context (such as pay for performance) can translate more easily from the adult context to the child context. Strategies that are closely intertwined with specific patient attributes or behaviors, interventions, organizational providers, or settings (e.g., portal for physicians to access patient self-reported outcomes as the basis for calibrating medications) may not easily translate from the adult to the child context.

Our limited findings with respect to QI may also speak to the widely recognized gap between established EBPs in mental health and the limited number of practitioners or organizations actually providing those EBPs. For example, cognitive behavioral therapy (CBT) is the widely accepted EBP for treating patients with childhood anxiety. A recent Cochrane review of CBT for childhood anxiety included 1,955 subjects from 41 studies.¹¹⁵ Meanwhile, in the community, a minority of children with an anxiety disorder actually receive any treatment,¹¹⁶ let alone CBT specifically.¹¹⁷

A constraint to this field may simply be that an insufficient body of clinicians and organizations delivers EBPs in order to be able to test implementation or dissemination strategies. One clinical and policy implication, then, is the need for basic dissemination and infrastructure development for the delivery of EBPs, in combination with other strategies to ensure both access to and incentives for uptake of EBPs.

QI concepts in child health and child mental health are becoming fixtures of modern clinical practice and continuing professional education, despite the shortcomings of evidence in the area. For example, the American Board of Pediatrics requires its members to demonstrate periodic participation in QI exercises with their own patients. Clinicians in child mental health are increasingly working in or for “accountable care organizations” (ACAs). These practitioners and these organizations will be increasingly eager for guidance on using EBPs efficiently and effectively. If ACAs require evidence of high-quality care in child mental health, then they are going to need access to a robust QI evidence base. Such a QI evidence base will need to be developed against a backdrop of health systems that provide already established EBPs far more than they currently do.

Limitations of the Systematic Review Process

Challenges in this systematic review arose from the sparse amount of prior literature on this topic that limited defining many of the details of our review a priori. Specifically, we struggled with (1) defining the strategy of interest, (2) constructing the search strategy, and (3) applying prespecified inclusion/exclusion criteria.

Regarding defining the strategy of interest, we did identify pragmatic definitions of QI, implementation, and dissemination that various systematic reviews or others had applied previously. We found, however, that applying them to *this* review was difficult. The lack of consistency in the terminology in the published literature meant that using descriptors such as “QI,” “implementation,” or “dissemination” selected by study authors did not (necessarily) conform to our a priori definitions of these types of studies or to the other similarly labeled studies in the field. As a result, we used the EPOC taxonomy to characterize strategies by their primary focus of their components and, thereby, to simplify both analysis and presentation. As noted in our description of our review methodology, we required multiple reviews of each included article and, on one occasion, outreach to authors to ensure that we interpreted the study correctly.

Regarding searches, we ran multiple iterations over a period of 6 months. We initially mirrored the search strategy in a previously published review.³⁹ However, we had to make

substantial changes to capture concepts or terms that were not indexed by the National Library of Medicine's medical subject headings.

Regarding the application of prespecified inclusion and exclusion criteria, attempts to specify the population criteria to ensure greater homogeneity of included strategies posed challenges when we came to review the evidence. For example, we had one criterion specifying that the system or clinic render care for children and adolescents with *existing* mental health issues (rather than deal only with the *risk of* mental health issues), but it proved difficult to apply in some cases. To limit the inadvertent loss of relevant articles in a field with inconsistent use of terminology and inadequate indexing, we did not automatically exclude prevention studies in our searches. As a consequence, we found numerous studies with inadequate reporting that required judgment on whether the system addressed children and adolescents who were (only) *at risk of* or who were *actually experiencing* mental health problems. For example, we encountered studies of adolescents in juvenile drug courts. Although the authors did not specify what proportion of adolescents experienced mental health issues, we relied on the clinical and substantive expertise of the team to judge that adolescents in juvenile drug courts would likely have substance abuse issues or externalizing behavior problems.

We included a broad range of eligible comparators in our protocol (usual care or any other QI, implementation, or dissemination strategy). In reviewing full-text studies, we encountered otherwise eligible studies in which the intervention combined both a patient-level intervention and a system-level strategy to implement or disseminate that intervention. In such cases, the use of a usual-care arm did not permit the authors to draw conclusions about the effect of the implementation or dissemination strategy apart from the underlying intervention.^{74-80,118}

Our inclusion and exclusion criteria were designed to capture QI, implementation, and dissemination studies across a range of strategies. Because of our criteria, all variants of a particular strategy may not have been captured along the timeline of its development and application in practice. Reviews focusing on a single strategy can evaluate variants of that strategy without using stringent criteria and construct a qualitative narrative about the arc of the development and implementation of that strategy, but such reviews cannot speak to QI, implementation, or dissemination in general. In other words, we traded a depth of understanding about the development and application of individual strategies for breadth in included strategy types.

Limitations of the Evidence Base

We found relatively few studies of effectiveness of strategies to improve the mental health care of children and adolescents, although evidence emerged that some are effective in improving both intermediate and patient health outcomes and resource use measures. Only one study focused on system-level intermediate outcomes; none focused on the costs of these strategies.

The lack of a common language to describe even a basic concern such as the primary purpose of the strategies (QI, implementation, or dissemination) hindered our evidence synthesis. Strategies varied greatly in the number of components. The reporting on these components was not always clear enough to describe the strategy adequately or to enable us to understand fully the relative importance of component parts. Studies often offered limited descriptions of “usual-care” arms (relative to the detailed descriptions of experimental arms). Even with limited reporting, we found wide differences in the number, intensity, and differences in services offered

in “usual-care” arms. These differences sharply limited our ability to make statements about the overall effectiveness of these strategies as a class.

Only one study examined harms. Additionally, although the field generally acknowledges the vast array of potentially influential moderators in implementation research,³² we uncovered only four studies on two moderators. The paucity of evidence on issues such as fidelity and adoption further limited our understanding of the minimum changes in strategy that might be needed to achieve meaningfully different process or health outcomes.

We rated several outcomes as insufficient or, at best, low strength of evidence for several reasons: the underlying heterogeneity or limited number of studies on specific strategy types, system or practitioner targets, or child or adolescent conditions. In some instances, our grades were limited by the high risk of bias in included studies; these ratings arose because of high attrition rates, failure to adjust analyses for baseline levels of key outcomes or clustering within practitioners or clinics, and failure to account for missing data.

Our ability to derive firm conclusions on the effectiveness of included strategies was also hindered by methodological and reporting issues in the literature. The strategies of relevance to this review generally required that study arms be defined at a systems level to reflect pragmatic considerations (e.g., the intervention changes a system characteristic) or to avoid contamination (e.g., a provider exposed to a new QI strategy may have difficulty applying the strategy selectively to some patients). Observational studies in general are more constrained than RCTs in their ability to make causal assertions because of the risk of confounding; observational studies of systems interventions have an additional burden of accounting for secular and unmeasured financial or organizational changes that may influence outcomes. Cluster randomized trials with clearly specified protocols allow interventions to be allocated appropriately at the systems level, with the potential to avoid the constraints of confounding and unmeasured cointerventions. However, the analyses of results from these trials required controls for clustering. These analyses (which typically require hierarchical linear modeling) were complex but investigators often did not report them well enough to permit an independent evaluation of the effect size,⁸⁸ precision of the effect,^{67,86,89,90} or risk of bias.^{88,89}

As documented in Table 31, QI, implementation, and dissemination trials often failed to report on basic elements of study design and conduct; this was true especially for sequence generation, allocation concealment, fidelity to the intervention, and the risk of contamination or crossover. Such lacunae in reporting occurred in all study design types, regardless of their underlying rigor and complexity.

Table 31. Studies with insufficient reporting on risk of bias domains

Domain with Insufficient Reporting to Assess Risk of Bias	Number and Type of Studies
Eligibility criteria	2 nonrandomized studies, ^{93,94} 2 trials ^{89,91}
Randomization sequence generation	6 trials ^{13,14,66,86,88,89,91}
Allocation concealment	7 trials ^{13,14,66,67,86,88,89,91}
Similarity of baseline characteristics	2 nonrandomized studies, ^{93,94} 8 trials ^{66,67,85,87-91}
Fidelity to intervention	4 nonrandomized studies, ^{66,93-95} 8 trials ^{13,14,66,86,88-92}
Overall attrition	3 nonrandomized studies, ^{66,93,94} 7 trials ^{13,14,66,67,84,86,90}
Attrition by study arm (differential attrition)	2 nonrandomized studies, ^{93,94} 5 trials ^{67,86,88,90,91}
Risk of contamination or crossover	4 nonrandomized studies, ^{66,93-95} 13 trials ^{13,14,66,67,84-92}

Finally, our proposed analyses reflect some limitations of QCA. First, models can be used to investigate only a few conditions of interest because QCA examines each possible combination of conditions; this property exponentially increases with each addition (e.g., 5 conditions yields 32 possible combinations, 6 conditions yields 64 possible conditions). Thus, combinations that have no data (i.e., have never been studied) cannot be analyzed. Another limitation is that the strategies themselves need to be at least somewhat comparable,¹¹⁹ allowing for investigation of only high-level components consistent across strategies.

For this analysis, we included 17 studies that met the criteria for the systematic review. Of the possible 256 combinations from our studies, 242 had no studies; thus, we had substantial limited diversity in our sample of cases. We managed this challenge by assessing different QCA solutions. Adding new studies with new evidence could introduce a new solution to showing significant improvements.

Contributions of Novel Analytic Approaches to Addressing Complex Interventions in Systematic Reviews

To address the limitations of the systematic review process and evidence base relevant to our review, we had to expand on traditional methods to assess the effectiveness of strategies to implement or disseminate evidence-based interventions for child mental health or to improve the quality of care. The complexity of both the evidence-based interventions and the implementation and dissemination strategies themselves, coupled with the absence of information on critical components, created challenges in our analysis. We sought to identify additional information about the critical components of each strategy by (1) searching for “sibling studies” (e.g., searches of related publications of the same intervention or same authors as the index publication) and searches of related publications by authors and (2) reaching out to investigators to understand what they believed to be the critical component of the strategy. We then used these findings to extract meaning from the synthesis through QCA, which helped us to cluster studies by common attributes in a way that adequately captured the multidimensional nature of these strategies.

Contributions From Searches of Related Publications

As noted earlier in this report, we found 1,158 studies and reviewed 33 in full text. Six articles then contributed to our understanding of included strategies. Of these, three helped us flesh out descriptions of the interventions.^{99,104,105} In three instances, we found explanations or insights on the barriers and facilitators to the strategy in the review^{96,97} or a subsequent iteration of the strategy¹⁰³ that did not meet inclusion criteria for our review.

In addition to these six publications, one article provided information on yet other outcomes to an already included study,⁶⁸ and one article met our inclusion criteria and was included as a full citation.⁹¹ We evaluated the indexing terms for both articles that contributed such additional data. In one instance,⁶⁸ we constructed an add-on to ensure that we had not missed any other relevant citations (and we had not). As suggested by these numbers, the yield, relative to the volume of searches, is modest. The effort did not produce similar extensions of understanding for all included strategies: we were able to add insights for only four included strategies.^{13,85,87,88} In our view, the most important contribution of this approach is that it helped us identify a new study⁹¹ and gave us additional outcomes data for an already included study.⁶⁸ Through these findings, this approach also helped alert us to a potential gap in our search strategies.

Contributions From Outreach to Investigators

As noted above, not all study teams published ancillary findings that could help us identify critical components. Outreach to investigators appeared to be a promising avenue to filling information gaps.

We contacted individual principal investigators to identify critical components of their particular strategies. Two principal investigators were deceased; we reached out to alternates. As noted in the results section, we received responses for 10 of 17 studies and identified differences between study arms. Because of the limited response rate, we were unable to use the data from this exercise as a way to sort and cluster interventions for analysis.

Although we hoped to fill information gaps using such outreach, we found that authors who had not published ancillary works were less likely to respond to our inquiries (5/12) than authors who had published findings in ancillary works (5/5).^{13,85,87,88} This finding suggests that a post hoc attempt to identify important information about strategies is likely to be of limited value. As investigative teams disband or shift focus over time, the kind of information that we needed is likely to be harder to come by if it is not published along with the main findings of the study. Our experience suggests that journals should require all investigators of QI, implementation, and dissemination studies to identify routinely the critical components of their strategies so that subsequent groups of researchers can replicate or build on their findings in other settings.

Contribution From Qualitative Comparative Analysis

Our QCA analysis was instrumental in identifying common attributes across several low strength of evidence findings, specifically that educational meetings, materials, and outreach programs can be successful in combination with reminders or providing practitioners. QCA is not constrained by reporting of ancillary findings or responses on interview questions, but it requires a sufficient number of cases and a small number of conditions to run meaningful analyses. We limited our ability to comment on successful solutions to the 12 cases demonstrating benefit and distilled the wide range of intervention components into a smaller number of conditions to meet these requirements.

Furthermore, we could not meaningfully address the full range of nuance and complexity of these interventions. Our application of QCA yielded insights on solutions (recipes for success) that we could not have obtained through traditional systematic review methods. However, these insights required substantial effort; the tasks include creating transparent decision rules for whether to “count” a component as part of the strategy, dually applying these rules through a careful and exhaustive read of the included publication and ancillary documents, using a theoretical framework to regroup components, testing multiple models, and validating the results of the models against the raw data of the publication.

Insights from QCA are hypothesis generating rather than hypothesis confirming. Adding new cases to the body of evidence can produce new recipes and new insights. QCA may be useful when traditional systematic review methods provide limited insights and hypothesis-generating insights have value.

Research Recommendations

The evidence base is marked by a small number of studies on diverse strategies and outcomes focusing on intermediate and health outcomes and resource use; we had very few studies on harms or moderators. Some additional research is forthcoming: a review of

clinicaltrials.gov yielded three ongoing trials that may be applicable to future reviews on the topic (NCT02097355, NCT01829308, NCT02271386). The first trial is examining the impact of a Web-based patient management and monitoring system (Integrated Clinical Information Sharing System) that was designed to track patients' disease symptoms and response to therapy over time in child and adolescent patients with attention deficit hyperactivity disorder (ADHD), asthma, autism, depression, or epilepsy (or combinations of these disorders) (NCT02097355). The second trial is documenting the impact of implementing two evidence-based intervention strategies (i.e., Screening, Brief Intervention, and Referral to Treatment, with, e.g., generalist versus specialist referral) on the outcomes of adolescent alcohol, tobacco, other drug use, and HIV risk behaviors (NCT01829308). The third trial is investigating the impact of educating and supporting primary care providers in the implementation of EBPs for ADHD (NCT02271386). All three studies will fill some of the evidence gaps by providing additional quantitative data on the effectiveness of strategies to improve intermediate and patient-centered outcomes. We outline specific suggestions for future studies in Table 32.

Table 32. Future research recommendations to better understand strategies to improve the mental health care of children

Focus Areas for New Research	Specific Research Recommendations
Strategies	<ul style="list-style-type: none"> Trials of Financial strategies Regulatory strategies Combination strategies such professional training with audit and feedback or reminders and collaborative care
Moderators of successful strategies	<ul style="list-style-type: none"> Patients, practitioners, organizations, or systems characteristics Intervention characteristics Setting characteristics Characteristics of the implementation process
Outcomes	<ul style="list-style-type: none"> Benefits for patients as well as implementation outcomes, particularly when the implementation strategy allows for changes in the underlying intervention Harms Appropriately timed outcome measures that allow time for change to occur Changes sustained over time
Reporting	<ul style="list-style-type: none"> Critical components of strategies Extent of fidelity to or adaptation of original intervention Crossover and contamination Details about design and conduct of complex studies, particularly cluster randomized trials
Other	<ul style="list-style-type: none"> Comparative effectiveness of strategies Resources needed to implement strategy Strategies for areas lacking adequate mental health services

Third-party payers are paying increasing attention to quality metrics, as health care systems move to accountable care models. We found no studies on regulatory components and just one study testing a financial component, specifically pay for performance.⁸⁵ Our findings of moderate strength of evidence of benefit for a pay-for-performance approach and low strength of evidence of benefit for strategies that include professional training coupled with organization change such as audit and feedback or reminders were limited to the specific clinical contexts of the included trials. These promising solutions require confirmation and further investigation across different populations, clinical conditions, and settings. In addition to expanding the modest body of

evidence thus far on professional training and financial or organizational change strategies, new studies should additionally evaluate regulatory and financial components to support the needs of ACAs in the near future.

Our review highlights the fact that the current state of the evidence does not give clinicians and health plan administrators a definitive understanding of best methods to introduce EBPs successfully into clinical settings. Future research efforts should evaluate variations of such programs according to patient, provider, organization, systems, and setting characteristics. A better understanding of these variables can impede or promote the implementation and dissemination of EBPs.

For example, Chorpita et al.¹²⁰ point out the need to address challenges that clinical providers face, such as concerns about how an EBP might address comorbidity, because much of clinical practice occurs in generalist settings in which the typical presenting patient has more than one type of problem or diagnosis. In such situations, the clinicians' perception of whether the treatment will be effective can be an important variable. They also note that better understanding of the social processes relevant to dissemination is crucial; they argue that the social influence process is at least in part responsible for the success (or lack of it) of implementation of different mental health treatments for children. Moreover, understanding more about training procedures and trainer characteristics is necessary to determining how best to change therapist practices. Similarly, understanding trainee characteristics is called for if those advocating change are going to be able to recognize barriers to clinicians' use of treatment strategies. Considering variables such as these will provide a framework to guide the development of QI and implementation or dissemination strategies. New taxonomies that are continually emerging, such as the revised EPOC taxonomy¹²¹ and the recently published findings from the Expert Recommendations for Implementing Change (ERIC) project,¹²² also will advance the field by clarifying the conceptual models that underlie this research.

We did not find evidence on the majority of the outcomes that we specified a priori. Of particular note, seven strategies (two from a single publication) relied on EBPs; for that reason, these investigators did not report patient health outcomes.^{66,85,87,91-93} When researchers maintain fidelity to the original intervention, the assumption that the same level of effectiveness will occur in a new trial is reasonable and leads to an efficient use of research funds. Unfortunately, not all studies measured fidelity adequately. New strategies relying on EBPs must, at a minimum, report on fidelity so that practitioners and policymakers can judge whether the strategy is, in fact, a new intervention rather than implementation or dissemination of an existing intervention. We found insufficient evidence on the unanticipated harms of these strategies.

Future research in this area requires appropriately timed outcome measures. One potential explanation for the lack of consistent demonstration of effectiveness across the included studies could be that studies reported on outcomes too early, before strategies had a chance to take effect. The included studies generally measured systems outcomes over the course of the intervention. One study measured adherence to CBT after 3 months of consultation,⁸⁷ and a second measured referrals to early intervention services at 4 months after intervention.⁹⁰ Although a third trial measured outcomes at 6 months from baseline, the intervention was ongoing for some portion of that period.⁸⁵ Studies generally measured patient outcomes within 6 months of completion of the trial, with two exceptions that measured outcomes at 18¹⁴ and 24 months,⁸⁸ respectively.

The risk of crossover or contamination is of particular concern in systems strategies, but only one study explicitly provided information on the risk of crossover or contamination. As noted

earlier, very few studies offered information on fidelity or on unanticipated changes. Information on pragmatic issues related to implementation (fidelity, adaptation, and minimum elements necessary to achieve change) may not necessarily require new studies on strategies with existing information; support of analyses done with data from existing studies may fill some of these gaps.

The majority of included studies appropriately used cluster RCTs. Cluster RCTs, like pragmatic trials, need more resources than standard RCTs, and they are harder to complete than conventional studies. An additional consideration of cluster RCTs relates to reporting. The studies we found were marked by poor reporting or failure to report key details of the strategy or differences across study arms. Concerns about the inadequacies of reporting have been noted elsewhere in the literature.^{123,124} A recent tool, the StaRI (standards for reporting implementation studies of complex interventions) offers standards for reporting implementation studies that, if adopted widely, can significantly improve the utility of these studies and hasten the pace of translation of evidence into practice.¹²⁵

Hybrid designs that blend effectiveness and implementation in the same study may be an important way to meet the immediate need for empirical evidence to guide clinical decisions and policies at the organization or system level.¹²⁶ Such use could accelerate the translation of research findings into practice.

Although the failure to use EBPs can lead to gaps between potential and achieved outcomes, closing such gaps requires more than just using an array of EBPs. What continues to be unknown is how to bridge the gap in the context of the finite resource of time allocated for a patient encounter. As expectations for documenting or checking off quality metrics for each action within a patient encounter increase, the risk of errors of omission or commission increases. For new information to be actionable, more evidence is needed on the relative merits of each action or strategy.

More research is needed on strategies for the QI, implementation, and dissemination of EBPs in psychotherapy treatments as well as medication treatments of mental illness in youth. Other important targets include the development of dissemination strategies for introducing mental health care into areas lacking in mental health care, for example, very rural areas with fewer mental health providers. In these areas especially, targeting primary care providers may be essential.

Conclusions

The evidence does not permit us to have a high degree of confidence about the efficacy of any one strategy. Nonetheless, our findings may have relevance for policymakers who do not require a high level of causal certainty (for example, in commissioning pilot studies). Our findings suggest that several approaches can improve both intermediate and final health outcomes and resource use. Twelve of the 17 included studies significantly improved at least one such outcome or measure. Moderate strength of evidence (from one RCT) supported using provider financial incentives (such as pay for performance) to improve the competence with which clinicians can implement EBPs.⁸⁴ We found inconsistent evidence on strategies involving educational meetings, materials, and outreach; these programs appeared to be successful in combination with reminders or providing practitioners with newly collected clinical information. We also found low strength of evidence for *no* benefit for initiatives that included only educational materials or educational meeting components (or both) or only educational materials and outreach components.^{87,88,90,91}

In addition to differences in strategies tested and their specific components, the heterogeneity in clinical conditions of the children and adolescents in these studies, in the various types of practitioners, and in the settings precluded definitive conclusions about the effectiveness of any one particular strategy. We were unable to judge the potential for harms associated with these approaches that might mitigate benefits; the single study reporting on harms yielded too little insights on this problem. The available evidence from four studies on two moderators does not permit us to make generalizations about the circumstances under which these strategies might work optimally.

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Appendix A. Search Strategy and Detailed Methods

11/13/14 PubMed

Search Query	Items found
#1 Search "Health Plan Implementation"[Mesh]	3925
#2 Search ("Quality Improvement"[Mesh] OR "quality improvement"[All Fields] OR "quality initiative"[All Fields])	23297
#3 Search (("Information Dissemination"[Mesh] OR "Diffusion of Innovation"[Mesh] OR "Health Information Management"[Mesh]))	25716
#4 Search (#1 or #2 or #3)	52013
#5 Search (("Patient Acceptance of Health Care"[Mesh] OR adaptation[tiab] OR disseminat*[tiab] OR "Feasibility Studies"[Mesh] OR feasibility[tiab] OR fidelity[tiab] OR implement*[tiab] OR penetration[tiab] OR supervision[tiab] OR sustain*[tiab] OR "Information Systems"[MeSH] OR uptake[tiab]))	1390899
#6 Search (("Guideline Adherence"[Mesh] OR "Evidence-Based Practice"[Mesh] OR "evidence based practice"[All Fields] OR "evidence-based practice"[All Fields] OR effect* OR evidence))	7753831
#7 Search (#5 and #6)	608070
#8 Search (#4 or #7)	651277
#9 Search ("mental health"[All Fields] OR "mental illness"[All Fields] OR "mental disorders"[All Fields] OR "mental disorder"[All Fields] OR psychopathology OR "Adjustment Disorders"[Mesh] OR "adjustment disorder"[All Fields] OR "anxiety disorder"[All Fields] OR agoraphobia OR "panic disorder"[All Fields] OR "Phobic Disorders"[Mesh] OR phobia OR "Stress Disorders, Post-Traumatic"[Mesh] OR "posttraumatic stress disorder"[All Fields] OR "post-traumatic stress disorder"[All Fields] OR "generalized anxiety disorder"[All Fields] OR "Obsessive-Compulsive Disorder"[Mesh] OR "obsessive compulsive disorder"[All Fields] OR "reactive attachment disorder"[All Fields] OR "Anxiety, Separation"[Mesh] OR "separation anxiety disorder"[All Fields] OR "Eating Disorders"[Mesh] OR "eating disorder"[All Fields] OR "anorexia nervosa"[All Fields] OR "bulimia nervosa"[All Fields] OR "Attention Deficit Disorder with Hyperactivity"[Mesh] OR "attention deficit hyperactivity disorder"[All Fields] OR "Attention Deficit and Disruptive Behavior Disorders"[Mesh] OR "conduct disorder"[All Fields] OR "oppositional defiant disorder"[All Fields] OR depression OR "depressive disorder"[All Fields] OR "Bipolar Disorder"[Mesh] OR "bipolar disorder"[All Fields] OR mania OR "dysthymic disorder"[All Fields] OR "Schizophrenia"[Mesh] OR schizophrenia OR "Psychotic Disorders"[Mesh] OR "psychotic disorder"[All Fields] OR encopresis OR "Personality Disorders"[Mesh] OR "personality disorder"[All Fields] OR "behavioral disorder"[All Fields] OR "behavioral disturbance"[All Fields] OR "serious emotional distress"[All Fields] OR "emotional disorder"[All Fields] OR "Substance-Related Disorders"[All Fields] OR "substance use disorder"[All Fields] OR "drug use disorder"[All Fields] OR "Alcohol-Related Disorders"[Mesh] OR "alcohol use disorder"[All Fields] OR "alcohol dependence"[All Fields] OR alcoholism OR "drug dependence"[All Fields] OR "cannabis dependence"[All Fields] OR "marijuana dependence"[All Fields] OR "Tobacco Use Disorder"[Mesh] OR "nicotine dependence"[All Fields] OR "substance dependence"[All Fields] OR "substance abuse"[All Fields] OR "alcohol abuse"[All Fields] OR "drug abuse"[All Fields] OR "cannabis abuse"[All Fields] OR "marijuana abuse"[All Fields])	932701
#10 Search (#8 and #9)	39308
#11 Search ("diffusion tensor" OR "diffusion tensors"))	9434
#12 Search (#10 not #11)	39276
#13 Search (#10 not #11) Filters: Editorial	200
#14 Search (#10 not #11) Filters: Editorial; Letter	376
#15 Search (#12 NOT #14)	38900
#16 Search (((randomized[title/abstract] AND controlled[title/abstract] AND trial[title/abstract]) OR (controlled[title/abstract] AND trial[title/abstract]) OR "controlled clinical trial"[publication type] OR "Randomized Controlled Trial"[Publication Type] OR "Single-Blind Method"[MeSH] OR "Double-Blind Method"[MeSH] OR "Random Allocation"[MeSH]))	583142
#17 Search (#15 and #16)	6024
#18 Search (("Cohort Studies"[MeSH] OR (prospective AND cohort)))	1380934
#19 Search (#15 and #18)	5327
#20 Search (#12 NOT #14) Filters: Review	6062
#21 Search (#17 or #19 or #20)	15664

Search Query	Items found
#22 Search (#17 or #19 or #20) Filters: Child: birth-18 years	3605

8/14/15 PubMed

Search Query	Items found
#1 Search "Health Plan Implementation"[Mesh]	4144
#2 Search ("Quality Improvement"[Mesh] OR "quality improvement"[All Fields] OR "quality initiative"[All Fields])	26941
#3 Search ("Information Dissemination"[Mesh] OR "Diffusion of Innovation"[Mesh] OR "Health Information Management"[Mesh])	27242
#4 Search (#1 or #2 or #3)	57286
#5 Search ("Patient Acceptance of Health Care"[Mesh] OR adaptation[tiab] OR disseminat*[tiab] OR "Feasibility Studies"[Mesh] OR feasibility[tiab] OR fidelity[tiab] OR implement*[tiab] OR penetration[tiab] OR supervision[tiab] OR sustain*[tiab] OR "Information Systems"[MeSH] OR uptake[tiab])	1477711
#6 Search ("Guideline Adherence"[Mesh] OR "Evidence-Based Practice"[Mesh] OR "evidence based practice"[All Fields] OR "evidence-based practice"[All Fields] OR effect* OR evidence)	8087430
#7 Search (#5 and #6)	647286
#8 Search (#4 or #7)	694719
#9 Search ("mental health"[All Fields] OR "mental illness"[All Fields] OR "mental disorders"[All Fields] OR "mental disorder"[All Fields] OR psychopathology OR "Adjustment Disorders"[Mesh] OR "adjustment disorder"[All Fields] OR "anxiety disorder"[All Fields] OR agoraphobia OR "panic disorder"[All Fields] OR "Phobic Disorders"[Mesh] OR phobia OR "Stress Disorders, Post-Traumatic"[Mesh] OR "posttraumatic stress disorder"[All Fields] OR "post-traumatic stress disorder"[All Fields] OR "generalized anxiety disorder"[All Fields] OR "Obsessive-Compulsive Disorder"[Mesh] OR "obsessive compulsive disorder"[All Fields] OR "reactive attachment disorder"[All Fields] OR "Anxiety, Separation"[Mesh] OR "separation anxiety disorder"[All Fields] OR "Eating Disorders"[Mesh] OR "eating disorder"[All Fields] OR "anorexia nervosa"[All Fields] OR "bulimia nervosa"[All Fields] OR "Attention Deficit Disorder with Hyperactivity"[Mesh] OR "attention deficit hyperactivity disorder"[All Fields] OR "Attention Deficit and Disruptive Behavior Disorders"[Mesh] OR "conduct disorder"[All Fields] OR "oppositional defiant disorder"[All Fields] OR depression OR "depressive disorder"[All Fields] OR "Bipolar Disorder"[Mesh] OR "bipolar disorder"[All Fields] OR mania OR "dysthymic disorder"[All Fields] OR "Schizophrenia"[Mesh] OR schizophrenia OR "Psychotic Disorders"[Mesh] OR "psychotic disorder"[All Fields] OR encopresis OR "Personality Disorders"[Mesh] OR "personality disorder"[All Fields] OR "behavioral disorder"[All Fields] OR "behavioral disturbance"[All Fields] OR "serious emotional distress"[All Fields] OR "emotional disorder"[All Fields] OR "Substance-Related Disorders"[All Fields] OR "substance use disorder"[All Fields] OR "drug use disorder"[All Fields] OR "Alcohol-Related Disorders"[Mesh] OR "alcohol use disorder"[All Fields] OR "alcohol dependence"[All Fields] OR alcoholism OR "drug dependence"[All Fields] OR "cannabis dependence"[All Fields] OR "marijuana dependence"[All Fields] OR "Tobacco Use Disorder"[Mesh] OR "nicotine dependence"[All Fields] OR "substance dependence"[All Fields] OR "substance abuse"[All Fields] OR "alcohol abuse"[All Fields] OR "drug abuse"[All Fields] OR "cannabis abuse"[All Fields] OR "marijuana abuse"[All Fields])	973381
#10 Search (#8 and #9)	42184
#11 Search ("diffusion tensor" OR "diffusion tensors")	10677
#12 Search (#10 NOT #11)	42149
#13 Search (#10 NOT #11) Filters: Editorial	215
#14 Search (#10 NOT #11) Filters: Editorial; Letter	406
#15 Search (#12 NOT #14)	41743
#16 Search (((randomized[title/abstract] AND controlled[title/abstract] AND trial[title/abstract]) OR (controlled[title/abstract] AND trial[title/abstract]) OR "controlled clinical trial"[publication type] OR "Randomized Controlled Trial"[Publication Type] OR "Single-Blind Method"[MeSH] OR "Double-Blind Method"[MeSH] OR "Random Allocation"[MeSH]))	609530
#17 Search (#15 and #16)	6569
#18 Search ("Cohort Studies"[MeSH] OR (prospective AND cohort))	1455199
#19 Search (#15 and #18)	5702

Search Query	Items found
#20 Search (#12 NOT #14) Filters: Review	6551
#21 Search (#17 or #19 or #20)	16936
#22 Search (#17 or #19 or #20) Filters: Child: birth-18 years	3858
#23 Search (#17 or #19 or #20) Filters: Publication date from 2014/02/13; Child: birth-18 years	262

12/9/15 PubMed Add on Search

Search Query	Items found
#2 Search (Community Mental Health Services/organization and administration [mesh]) OR Social Medicine/organization and administration [mesh]))	9187
#3 Search (((("mental health"[All Fields] OR "mental illness"[All Fields] OR "mental disorders"[All Fields] OR "mental disorder"[All Fields] OR psychopathology OR "Adjustment Disorders"[Mesh] OR "adjustment disorder"[All Fields] OR "anxiety disorder"[All Fields] OR agoraphobia OR "panic disorder"[All Fields] OR "Phobic Disorders"[Mesh] OR phobia OR "Stress Disorders, Post-Traumatic"[Mesh] OR "posttraumatic stress disorder"[All Fields] OR "post-traumatic stress disorder"[All Fields] OR "generalized anxiety disorder"[All Fields] OR "Obsessive-Compulsive Disorder"[Mesh] OR "obsessive compulsive disorder"[All Fields] OR "reactive attachment disorder"[All Fields] OR "Anxiety, Separation"[Mesh] OR "separation anxiety disorder"[All Fields] OR "Eating Disorders"[Mesh] OR "eating disorder"[All Fields] OR "anorexia nervosa"[All Fields] OR "bulimia nervosa"[All Fields] OR "Attention Deficit Disorder with Hyperactivity"[Mesh] OR "attention deficit hyperactivity disorder"[All Fields] OR "Attention Deficit and Disruptive Behavior Disorders"[Mesh] OR "conduct disorder"[All Fields] OR "oppositional defiant disorder"[All Fields] OR depression OR "depressive disorder"[All Fields] OR "Bipolar Disorder"[Mesh] OR "bipolar disorder"[All Fields] OR mania OR "dysthymic disorder"[All Fields] OR "Schizophrenia"[Mesh] OR schizophrenia OR "Psychotic Disorders"[Mesh] OR "psychotic disorder"[All Fields] OR encopresis OR "Personality Disorders"[Mesh] OR "personality disorder"[All Fields] OR "behavioral disorder"[All Fields] OR "behavioral disturbance"[All Fields] OR "serious emotional distress"[All Fields] OR "emotional disorder"[All Fields] OR "Substance-Related Disorders"[All Fields] OR "substance use disorder"[All Fields] OR "drug use disorder"[All Fields] OR "Alcohol-Related Disorders"[Mesh] OR "alcohol use disorder"[All Fields] OR "alcohol dependence"[All Fields] OR alcoholism OR "drug dependence"[All Fields] OR "cannabis dependence"[All Fields] OR "marijuana dependence"[All Fields] OR "Tobacco Use Disorder"[Mesh] OR "nicotine dependence"[All Fields] OR "substance dependence"[All Fields] OR "substance abuse"[All Fields] OR "alcohol abuse"[All Fields] OR "drug abuse"[All Fields] OR "cannabis abuse"[All Fields] OR "marijuana abuse"[All Fields])))	990413
#4 Search ((#2 AND #3))	8847
#5 Search (((("diffusion tensor" OR "diffusion tensors"))))	11142
#6 Search (((#4 NOT #5)))	8847
#7 Search (((#4 NOT #5))) Filters: Child: birth-18 years	1792
#8 Search ((((((randomized[title/abstract] AND controlled[title/abstract] AND trial[title/abstract]) OR (controlled[title/abstract] AND trial[title/abstract]) OR "controlled clinical trial"[publication type] OR "Randomized Controlled Trial"[Publication Type] OR "Single-Blind Method"[MeSH] OR "Double-Blind Method"[MeSH] OR "Random Allocation"[MeSH]))))	619652
#9 Search (#7 AND #8)	101
#10 Search (((("Cohort Studies"[MeSH] OR (prospective AND cohort))))	1482309
#11 Search (#7 and #10)	211
#12 Search (((#4 NOT #5))) Filters: Review; Child: birth-18 years	100

1/14/16 PubMed

Search Query	Items found
#1 Search "Health Plan Implementation"[Mesh]	4268
#2 Search (("Quality Improvement"[Mesh] OR "quality improvement"[All Fields] OR "quality initiative"[All Fields]))	29143
#3 Search ("Information Dissemination"[Mesh] OR "Diffusion of Innovation"[Mesh] OR "Health	37223

Search Query	Items found
Information Management"[Mesh] OR Community Mental Health Services/organization and administration [mesh] OR Social Medicine/organization and administration [mesh])	
#4 Search ((#1 or #2 or #3))	69380
#5 Search (("Patient Acceptance of Health Care"[Mesh] OR adaptation[tiab] OR disseminat*[tiab] OR "Feasibility Studies"[Mesh] OR feasibility[tiab] OR fidelity[tiab] OR implement*[tiab] OR penetration[tiab] OR supervision[tiab] OR sustain*[tiab] OR "Information Systems"[MeSH] OR uptake[tiab]))	1530734
#6 Search (("Guideline Adherence"[Mesh] OR "Evidence-Based Practice"[Mesh] OR "evidence based practice"[All Fields] OR "evidence-based practice"[All Fields] OR effect* OR evidence))	8271369
#7 Search ((#5 and #6))	671035
#8 Search ((#4 or #7))	729296
#9 Search (("mental health"[All Fields] OR "mental illness"[All Fields] OR "mental disorders"[All Fields] OR "mental disorder"[All Fields] OR psychopathology OR "Adjustment Disorders"[Mesh] OR "adjustment disorder"[All Fields] OR "anxiety disorder"[All Fields] OR agoraphobia OR "panic disorder"[All Fields] OR "Phobic Disorders"[Mesh] OR phobia OR "Stress Disorders, Post-Traumatic"[Mesh] OR "posttraumatic stress disorder"[All Fields] OR "post-traumatic stress disorder"[All Fields] OR "generalized anxiety disorder"[All Fields] OR "Obsessive-Compulsive Disorder"[Mesh] OR "obsessive compulsive disorder"[All Fields] OR "reactive attachment disorder"[All Fields] OR "Anxiety, Separation"[Mesh] OR "separation anxiety disorder"[All Fields] OR "Eating Disorders"[Mesh] OR "eating disorder"[All Fields] OR "anorexia nervosa"[All Fields] OR "bulimia nervosa"[All Fields] OR "Attention Deficit Disorder with Hyperactivity"[Mesh] OR "attention deficit hyperactivity disorder"[All Fields] OR "Attention Deficit and Disruptive Behavior Disorders"[Mesh] OR "conduct disorder"[All Fields] OR "oppositional defiant disorder"[All Fields] OR depression OR "depressive disorder"[All Fields] OR "Bipolar Disorder"[Mesh] OR "bipolar disorder"[All Fields] OR mania OR "dysthymic disorder"[All Fields] OR "Schizophrenia"[Mesh] OR schizophrenia OR "Psychotic Disorders"[Mesh] OR "psychotic disorder"[All Fields] OR encopresis OR "Personality Disorders"[Mesh] OR "personality disorder"[All Fields] OR "behavioral disorder"[All Fields] OR "behavioral disturbance"[All Fields] OR "serious emotional distress"[All Fields] OR "emotional disorder"[All Fields] OR "Substance-Related Disorders"[All Fields] OR "substance use disorder"[All Fields] OR "drug use disorder"[All Fields] OR "Alcohol-Related Disorders"[Mesh] OR "alcohol use disorder"[All Fields] OR "alcohol dependence"[All Fields] OR alcoholism OR "drug dependence"[All Fields] OR "cannabis dependence"[All Fields] OR "marijuana dependence"[All Fields] OR "Tobacco Use Disorder"[Mesh] OR "nicotine dependence"[All Fields] OR "substance dependence"[All Fields] OR "substance abuse"[All Fields] OR "alcohol abuse"[All Fields] OR "drug abuse"[All Fields] OR "cannabis abuse"[All Fields] OR "marijuana abuse"[All Fields]))	1001782
#10 Search ((#8 and #9))	52648
#11 Search (("diffusion tensor" OR "diffusion tensors"))	11297
#12 Search ((#10 NOT #11))	52609
#13 Search ((#10 NOT #11)) Filters: Editorial	458
#14 Search ((#10 NOT #11)) Filters: Editorial; Letter	961
#15 Search ((#12 NOT #14))	51648
#16 Search (((randomized[title/abstract] AND controlled[title/abstract] AND trial[title/abstract]) OR (controlled[title/abstract] AND trial[title/abstract]) OR "controlled clinical trial"[publication type] OR "Randomized Controlled Trial"[Publication Type] OR "Single-Blind Method"[MeSH] OR "Double-Blind Method"[MeSH] OR "Random Allocation"[MeSH]))	624632
#17 Search ((#15 and #16))	7442
#18 Search (("Cohort Studies"[MeSH] OR (prospective AND cohort)))	1499221
#19 Search ((#15 and #18))	6756
#20 Search ((#12 NOT #14)) Filters: Review	7413
#21 Search ((#17 or #19 or #20))	19445
#22 Search ((#17 or #19 or #20)) Filters: Child: birth-18 years	4504
#23 Search ((#17 or #19 or #20)) Filters: Publication date from 2015/07/14; Child: birth-18 years	15

11/13/14 Cochrane Library

ID	Search	Hits
#1	[mh "Health Plan Implementation"]	87

#2	[mh "Quality Improvement"] or [mh "quality improvement"] or "quality initiative"	303
#3	[mh "Information Dissemination"] or [mh "Diffusion of Innovation"] or [mh "Health Information Management"]	324
#4	#1 or #2 or #3	696
#5	[mh "Patient Acceptance of Health Care"] or adaptation or disseminat* or [mh "Feasibility Studies"] or feasibility or fidelity or implement* or penetration or supervision or sustain* or [mh "Information Systems"] or uptake	126782
#6	[mh "Guideline Adherence"] or [mh "Evidence-Based Practice"] or "evidence based practice" or "evidence-based practice" or effect* or evidence	534664
#7	#5 and #6	102061
#8	#4 or #7	102351
#9	"mental health" or "mental illness" or "mental disorders" or "mental disorder" or psychopathology or [mh "Adjustment Disorders"] or "adjustment disorder" or "anxiety disorder" or agoraphobia or "panic disorder" or [mh "Phobic Disorders"] or phobia or [mh "Stress Disorders, Post-Traumatic"] or "posttraumatic stress disorder" or "post-traumatic stress disorder" or "generalized anxiety disorder" or [mh "Obsessive-Compulsive Disorder"] or "obsessive compulsive disorder" or "reactive attachment disorder" or [mh "Anxiety, Separation"] or "separation anxiety disorder" or [mh "Eating Disorders"] or "eating disorder" or "anorexia nervosa" or "bulimia nervosa" or [mh "Attention Deficit Disorder with Hyperactivity"] or "attention deficit hyperactivity disorder" or [mh "Attention Deficit and Disruptive Behavior Disorders"] or "conduct disorder" or "oppositional defiant disorder" or depression or "depressive disorder" or [mh "Bipolar Disorder"] or "bipolar disorder" or mania or "dysthymic disorder" or [mh Schizophrenia] or schizophrenia or [mh "Psychotic Disorders"] or "psychotic disorder" or encopresis or [mh "Personality Disorders"] or "personality disorder" or "behavioral disorder" or "behavioral disturbance" or "serious emotional distress" or "emotional disorder" or "Substance-Related Disorders" or "substance use disorder" or "drug use disorder" or [mh "Alcohol-Related Disorders"] or "alcohol use disorder" or "alcohol dependence" or alcoholism or "drug dependence" or "cannabis dependence" or "marijuana dependence" or [mh "Tobacco Use Disorder"] or "nicotine dependence" or "substance dependence" or "substance abuse" or "alcohol abuse" or "drug abuse" or "cannabis abuse" or "marijuana abuse"	73438
#10	#8 and #9	14782
#11	"diffusion tensor" or "diffusion tensors"	167
#12	#10 not #11	14778
#13	editorial* or letter*	18489
#14	#12 not #13	13249
#15	child* or children or teen or teens or teenage or teenaged or adolescen* or pediatric or paediatric* or boys or girls or youth or youths	162576
#16	#14 and #15	3712
#17	((randomized and controlled) and trial) or (controlled and trial) or "controlled clinical trial":pt or "Randomized Controlled Trial":pt or [mh "Single-Blind Method"] or [mh "Double-Blind Method"] or [mh "Random Allocation"]	853453
#18	#16 and #17	3352
#19	[mh "Cohort Studies"] or (prospective and cohort)	118246
#20	#16 and #19	737
#21	#18 or #20	3616

9/2/15 Cochrane Library

ID	Search	Hits
#1	[mh "Health Plan Implementation"]	91
#2	[mh "Quality Improvement"] or [mh "quality improvement"] or "quality initiative"	354
#3	[mh "Information Dissemination"] or [mh "Diffusion of Innovation"] or [mh "Health Information Management"]	346
#4	#1 or #2 or #3	772
#5	[mh "Patient Acceptance of Health Care"] or adaptation or disseminat* or [mh "Feasibility Studies"] or feasibility or fidelity or implement* or penetration or supervision or sustain* or [mh "Information Systems"] or uptake	139013
#6	[mh "Guideline Adherence"] or [mh "Evidence-Based Practice"] or "evidence based practice" or "evidence-based practice" or effect* or evidence	583827
#7	#5 and #6	111763
#8	#4 or #7	112083
#9	"mental health" or "mental illness" or "mental disorders" or "mental disorder" or psychopathology or [mh "Adjustment Disorders"] or "adjustment disorder" or "anxiety disorder" or agoraphobia or "panic disorder" or [mh "Phobic Disorders"] or phobia or [mh "Stress Disorders, Post-Traumatic"] or "posttraumatic stress disorder" or "post-traumatic stress disorder" or "generalized anxiety disorder" or [mh "Obsessive-Compulsive Disorder"] or "obsessive compulsive disorder" or "reactive attachment disorder" or [mh "Anxiety, Separation"] or "separation anxiety disorder" or [mh "Eating Disorders"] or "eating disorder" or "anorexia nervosa" or "bulimia nervosa" or [mh "Attention Deficit Disorder with Hyperactivity"] or "attention deficit hyperactivity disorder" or [mh "Attention Deficit and Disruptive Behavior Disorders"] or "conduct disorder" or "oppositional defiant disorder" or depression or "depressive disorder" or [mh "Bipolar Disorder"] or "bipolar disorder" or mania or "dysthymic disorder" or [mh Schizophrenia] or schizophrenia or [mh "Psychotic Disorders"] or "psychotic disorder" or encopresis or [mh "Personality Disorders"] or "personality disorder" or "behavioral disorder" or "behavioral disturbance" or "serious emotional distress" or "emotional disorder" or "Substance-Related Disorders" or "substance use disorder" or "drug use disorder" or [mh "Alcohol-Related Disorders"] or "alcohol use disorder" or "alcohol dependence" or alcoholism or "drug dependence" or "cannabis dependence" or "marijuana dependence" or [mh "Tobacco Use Disorder"] or "nicotine dependence" or "substance dependence" or "substance abuse" or "alcohol abuse" or "drug abuse" or "cannabis abuse" or "marijuana abuse"	81224
#10	#8 and #9	16367
#11	"diffusion tensor" or "diffusion tensors"	224
#12	#10 not #11	16362
#13	editorial* or letter*	19927
#14	#12 not #13	14707
#15	child* or children or teen or teens or teenage or teenaged or adolescen* or pediatric or paediatric* or boys or girls or youth or youths	172821
#16	#14 and #15	4038
#17	((randomized and controlled) and trial) or (controlled and trial) or "controlled clinical trial":pt or "Randomized Controlled Trial":pt or [mh "Single-Blind Method"] or [mh "Double-Blind Method"] or [mh "Random Allocation"]	620555
#18	#16 and #17	3160
#19	[mh "Cohort Studies"] or (prospective and cohort)	120469
#20	#16 and #19	775
#21	#18 or #20	3259
#22	#21 Publication Year from 2014 to 2015	304

12/9/15 Cochrane Library Add on Search

ID	Search	Hits
#1	MeSH descriptor: [Community Mental Health Services] explode all trees and with qualifier(s): [Organization & administration - OG]	110
#2	MeSH descriptor: [Social Medicine] explode all trees and with qualifier(s): [Organization & administration - OG]	2
#3	#1 or #2	112
#4	"mental health" or "mental illness" or "mental disorders" or "mental disorder" or psychopathology or [mh "Adjustment Disorders"] or "adjustment disorder" or "anxiety disorder" or agoraphobia or "panic disorder" or [mh "Phobic Disorders"] or phobia or [mh "Stress Disorders, Post-Traumatic"] or "posttraumatic stress disorder" or "post-traumatic stress disorder" or "generalized anxiety disorder" or [mh "Obsessive-Compulsive Disorder"] or "obsessive compulsive disorder" or "reactive attachment disorder" or [mh "Anxiety, Separation"] or "separation anxiety disorder" or [mh "Eating Disorders"] or "eating disorder" or "anorexia nervosa" or "bulimia nervosa" or [mh "Attention Deficit Disorder with Hyperactivity"] or "attention deficit hyperactivity disorder" or [mh "Attention Deficit and Disruptive Behavior Disorders"] or "conduct disorder" or "oppositional defiant disorder" or depression or "depressive disorder" or [mh "Bipolar Disorder"] or "bipolar disorder" or mania or "dysthymic disorder" or [mh Schizophrenia] or schizophrenia or [mh "Psychotic Disorders"] or "psychotic disorder" or encopresis or [mh "Personality Disorders"] or "personality disorder" or "behavioral disorder" or "behavioral disturbance" or "serious emotional distress" or "emotional disorder" or "Substance-Related Disorders" or "substance use disorder" or "drug use disorder" or [mh "Alcohol-Related Disorders"] or "alcohol use disorder" or "alcohol dependence" or alcoholism or "drug dependence" or "cannabis dependence" or "marijuana dependence" or [mh "Tobacco Use Disorder"] or "nicotine dependence" or "substance dependence" or "substance abuse" or "alcohol abuse" or "drug abuse" or "cannabis abuse" or "marijuana abuse"	83018
#5	#4 and #3	110
#6	"diffusion tensor" or "diffusion tensors"	236
#7	#5 not #6	110
#8	child* or children or teen or teens or teenage or teenaged or adolescen* or pediatric or paediatric* or boys or girls or youth or youths	175406
#9	#7 and #8	42

1/14/16 Cochrane Library

ID	Search	Hits
#1	[mh "Health Plan Implementation"]	93
#2	[mh "Quality Improvement"] or [mh "quality improvement"] or "quality initiative"	371
#3	[mh "Information Dissemination"] or [mh "Diffusion of Innovation"] or [mh "Health Information Management"]	347
#4	MeSH descriptor: [Community Mental Health Services] explode all trees and with qualifier(s): [Organization & administration - OG]	110
#5	MeSH descriptor: [Social Medicine] explode all trees and with qualifier(s): [Organization & administration - OG]	2
#6	#1 or #2 or #3 or #4 or #5	895
#7	[mh "Patient Acceptance of Health Care"] or adaptation or disseminat* or [mh "Feasibility Studies"] or feasibility or fidelity or implement* or penetration or supervision or sustain* or [mh "Information Systems"] or uptake	141594
#8	[mh "Guideline Adherence"] or [mh "Evidence-Based Practice"] or "evidence based practice" or "evidence-based practice" or effect* or evidence	597545
#9	#7 and #8	113597
#10	#6 or #9	113985
#11	"mental health" or "mental illness" or "mental disorders" or "mental disorder" or psychopathology or [mh "Adjustment Disorders"] or "adjustment disorder" or "anxiety disorder" or agoraphobia or "panic disorder" or [mh "Phobic Disorders"] or phobia or [mh "Stress Disorders, Post-Traumatic"] or "posttraumatic stress disorder" or "post-traumatic stress disorder" or "generalized anxiety disorder" or [mh "Obsessive-Compulsive Disorder"] or "obsessive compulsive disorder" or "reactive attachment disorder" or [mh "Anxiety, Separation"] or "separation anxiety disorder" or [mh "Eating Disorders"] or "eating disorder" or "anorexia nervosa" or "bulimia nervosa" or [mh "Attention Deficit Disorder with Hyperactivity"] or "attention deficit hyperactivity disorder" or [mh "Attention Deficit and Disruptive Behavior Disorders"] or "conduct disorder" or "oppositional defiant disorder" or depression or "depressive disorder" or [mh "Bipolar Disorder"] or "bipolar disorder" or mania or "dysthymic disorder" or [mh Schizophrenia] or schizophrenia or [mh "Psychotic Disorders"] or "psychotic disorder" or encopresis or [mh "Personality Disorders"] or "personality disorder" or "behavioral disorder" or "behavioral disturbance" or "serious emotional distress" or "emotional disorder" or "Substance-Related Disorders" or "substance use disorder" or "drug use disorder" or [mh "Alcohol-Related Disorders"] or "alcohol use disorder" or "alcohol dependence" or alcoholism or "drug dependence" or "cannabis dependence" or "marijuana dependence" or [mh "Tobacco Use Disorder"] or "nicotine dependence" or "substance dependence" or "substance abuse" or "alcohol abuse" or "drug abuse" or "cannabis abuse" or "marijuana abuse"	83516
#12	#10 and #11	16857
#13	"diffusion tensor" or "diffusion tensors"	241
#14	#12 not #13	16851
#15	editorial* or letter*	20444
#16	#14 not #15	15119
#17	child* or children or teen or teens or teenage or teenaged or adolescen* or pediatric or paediatric* or boys or girls or youth or youths	176120
#18	#16 and #17	4141
#19	((randomized and controlled) and trial) or (controlled and trial) or "controlled clinical trial":pt or "Randomized Controlled Trial":pt or [mh "Single-Blind Method"] or [mh "Double-Blind Method"] or [mh "Random Allocation"]	636835
#20	#18 and #19	3259
#21	[mh "Cohort Studies"] or (prospective and cohort)	121388
#22	#18 and #21	783
#23	#20 or #22 Publication Year from 2015 to 2016	186

12/2/14 CINAHL

#	Query	Limiters/Expanders	Last Run Via	Results
S23 S22		Limiters - English Language Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL with Full Text	504
S22 S21		Limiters - Age Groups: All Child Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL with Full Text	507
S21 S17 OR S19 OR S20		Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL with Full Text	2,272
S20 S12		Limiters - Publication Type: Review Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL with Full Text	838
S19 S12 and S18		Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL with Full Text	273
S18 (MH "Prospective Studies+") AND (prospective AND cohort)		Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL with Full Text	28,100
S17 S14 OR S16		Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL with Full Text	1,178
S16 S12 AND S15		Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL with Full Text	1,013
S15 (((randomized AND controlled) AND trial) OR (controlled AND trial)) OR ("controlled clinical trial" OR "single-blind method" OR "double-blind method" OR "random allocation")		Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL with Full Text	33,779
S14 S12		Limiters - Randomized Controlled Trials Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL with Full Text	559
S13 S10 not S11		Limiters - Publication Type: Editorial, Letter Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL with Full Text	236
S12 S10 not S11		Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL with Full Text	15,636
S11 "diffusion tensor" OR "diffusion tensors"		Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL with Full Text	702
S10 S8 AND S9		Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL with Full Text	15,641
S9 "mental health" OR "mental illness"		Search modes -	Interface - EBSCOhost Research	273,908

#	Query	Limiters/Expanders	Last Run Via	Results
	OR "mental disorders" OR "mental disorder" OR psychopathology OR "Adjustment Disorders" OR "adjustment disorder" OR "anxiety disorder" OR agoraphobia OR "panic disorder" OR (MH "Phobic Disorders+") OR phobia OR (MH "Stress Disorders, Post-Traumatic+") OR "posttraumatic stress disorder" OR "post-traumatic stress disorder" OR "generalized anxiety disorder" OR (MH "Obsessive-Compulsive Disorder+") OR "obsessive compulsive disorder" OR "reactive attachment disorder" OR (MH "Separation Anxiety") OR "separation anxiety disorder" OR (MH "Eating Disorders+") OR "eating disorder" OR "anorexia nervosa" OR "bulimia nervosa" OR (MH "Attention Deficit Hyperactivity Disorder") OR "attention deficit hyperactivity disorder" OR (MH "Attention Deficit Hyperactivity Disorder") OR "conduct disorder" OR "oppositional defiant disorder" OR depression OR "depressive disorder" OR (MH "Bipolar Disorder+") OR "bipolar disorder" OR mania OR "dysthymic disorder" OR schizophrenia OR (MH "Psychotic Disorders+") OR "psychotic disorder" OR encopresis OR (MH "Personality Disorders+") OR "personality disorder" OR "behavioral disorder" OR "behavioral disturbance" OR "serious emotional distress" OR "emotional disorder" OR (MH "Substance Use Disorders+") OR "Substance-Related Disorders" OR "substance use disorder" OR "drug use disorder" OR (MH "Alcohol-Related Disorders+") OR "alcohol use disorder" OR "alcohol dependence" OR alcoholism OR "drug dependence" OR "cannabis dependence" OR "marijuana dependence" OR "Tobacco Use Disorder" OR "nicotine dependence" OR "substance dependence" OR "substance abuse" OR "alcohol abuse" OR "drug abuse" OR "cannabis abuse" OR "marijuana abuse"	Boolean/Phrase	Databases Search Screen - Advanced Search Database - CINAHL with Full Text	
S8	S4 OR S7	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL with Full Text	125,198
S7	S5 AND S6	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL with Full Text	94,374
S6	(MH "Guideline Adherence") OR (MH "Professional Practice, Evidence-	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases	656,700

#	Query	Limiters/Expanders	Last Run Via	Results
	Based+") OR "evidence based practice" OR "evidence-based practice" OR effect* OR evidence		Search Screen - Advanced Search Database - CINAHL with Full Text	
S5	"Patient Acceptance of Health Care" OR (MH "Pilot Studies") OR adaptation OR disseminat* OR (MH "Pilot Studies") OR feasibility OR fidelity OR implement* OR penetration OR supervision OR sustain* OR (MH "Information Systems+") OR uptake	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL with Full Text	254,437
S4	S1 OR S2 OR S3	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL with Full Text	34,785
S3	"Information Dissemination" OR (MH "Diffusion of Innovation") OR (MH "Health Information Management")	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL with Full Text	7,840
S2	"quality improvement" OR "quality initiative"	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL with Full Text	27,386
S1	"Health Plan Implementation"	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL with Full Text	1

8/14/15 CINAHL

#	Query	Limiters/Expanders	Results
S24	S23	Limiters - Published Date: 20131201- Search modes - Boolean/Phrase	113
S23	S22	Limiters - English Language Search modes - Boolean/Phrase	724
S22	S21	Limiters - Age Groups: All Child Search modes - Boolean/Phrase	727
S21	S17 OR S19 OR S20	Search modes - Boolean/Phrase	3,223
S20	S12	Limiters - Publication Type: Review Search modes - Boolean/Phrase	1,148
S19	S12 and S18	Search modes - Boolean/Phrase	342
S18	(MH "Prospective Studies+") AND (prospective AND cohort)	Search modes - Boolean/Phrase	38,311
S17	S14 OR S16	Search modes - Boolean/Phrase	1,757
S16	S12 AND S15	Search modes - Boolean/Phrase	1,408
S15	(((randomized AND controlled) AND trial) OR (controlled AND trial)) OR ("controlled clinical trial" OR "single-blind method" OR "double-blind method" OR "random allocation")	Search modes - Boolean/Phrase	49,635
S14	S12	Limiters - Publication Type: Randomized Controlled Trial Search modes - Boolean/Phrase	975
S13	S12	Limiters - Publication Type: Editorial, Letter Search modes - Boolean/Phrase	347
S12	S10 not S11	Search modes - Boolean/Phrase	20,801
S11	"diffusion tensor" OR "diffusion tensors"	Search modes - Boolean/Phrase	1,472
S10	S8 AND S9	Search modes - Boolean/Phrase	20,809
S9	"mental health" OR "mental illness" OR "mental disorders" OR "mental disorder" OR psychopathology OR "Adjustment Disorders" OR "adjustment disorder" OR "anxiety disorder" OR agoraphobia OR "panic disorder" OR (MH "Phobic Disorders+") OR phobia OR (MH "Stress Disorders, Post-Traumatic+") OR "posttraumatic stress disorder" OR "post-traumatic stress disorder" OR "generalized anxiety disorder" OR (MH "Obsessive-Compulsive Disorder+") OR "obsessive compulsive disorder" OR "reactive attachment disorder" OR (MH "Separation Anxiety") OR "separation anxiety disorder" OR (MH "Eating Disorders+") OR "eating disorder" OR "anorexia nervosa" OR "bulimia nervosa" OR (MH "Attention Deficit Hyperactivity Disorder") OR "attention deficit hyperactivity disorder" OR (MH "Attention Deficit Hyperactivity Disorder") OR "conduct disorder" OR "oppositional defiant disorder" OR depression OR "depressive disorder" OR (MH "Bipolar Disorder+") OR "bipolar disorder" OR mania OR "dysthymic disorder" OR schizophrenia OR (MH "Psychotic Disorders+") OR "psychotic disorder" OR encopresis OR (MH "Personality Disorders+") OR "personality disorder" OR "behavioral disorder" OR "behavioral disturbance" OR "serious emotional distress" OR "emotional disorder" OR (MH "Substance Use Disorders+") OR "Substance-Related Disorders" OR "substance use disorder" OR "drug use disorder" OR (MH "Alcohol-Related Disorders+") OR "alcohol use	Search modes - Boolean/Phrase	394,194

#	Query	Limiters/Expanders	Results
	disorder" OR "alcohol dependence" OR alcoholism OR "drug dependence" OR "cannabis dependence" OR "marijuana dependence" OR "Tobacco Use Disorder" OR "nicotine dependence" OR "substance dependence" OR "substance abuse" OR "alcohol abuse" OR "drug abuse" OR "cannabis abuse" OR "marijuana abuse"		
S8	S4 OR S7	Search modes - Boolean/Phrase	163,503
S7	S5 AND S6	Search modes - Boolean/Phrase	123,202
S6	(MH "Guideline Adherence") OR (MH "Professional Practice, Evidence-Based+") OR "evidence based practice" OR "evidence-based practice" OR effect* OR evidence	Search modes - Boolean/Phrase	939,942
S5	"Patient Acceptance of Health Care" OR (MH "Pilot Studies") OR adaptation OR disseminat* OR (MH "Pilot Studies") OR feasibility OR fidelity OR implement* OR penetration OR supervision OR sustain* OR (MH "Information Systems+") OR uptake	Search modes - Boolean/Phrase	348,460
S4	S1 OR S2 OR S3	Search modes - Boolean/Phrase	45,135
S3	"Information Dissemination" OR (MH "Diffusion of Innovation") OR (MH "Health Information Management")	Search modes - Boolean/Phrase	10,962
S2	"quality improvement" OR "quality initiative"	Search modes - Boolean/Phrase	34,728
S1	"Health Plan Implementation"	Search modes - Boolean/Phrase	2

12/10/15 CINAHL Add on Search

#	Query	Limiters/Expanders	Last Run Via	Results
S14	S11 OR S13	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL Plus with Full Text	13
S13	S8 AND S12	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL Plus with Full Text	9
S12	S9 OR S10	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL Plus with Full Text	30,049
S11	S8	Limiters - Publication Type: Review Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL Plus with Full Text	4
S10	(MH "Prospective Studies+") AND (prospective AND cohort)	Limiters - Age Groups: Fetus, Conception to Birth, Infant, Newborn: birth-1 month, Infant: 1-23 months, Child, Preschool: 2-5 years, Child: 6-12 years, Adolescent: 13-18 years Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL Plus with Full Text	12,422
S9	((randomized AND controlled) AND trial) OR (controlled AND trial)) OR ("controlled clinical trial" OR "single-blind method" OR "double-blind method" OR "random allocation"	Limiters - Age Groups: Fetus, Conception to Birth, Infant, Newborn: birth-1 month, Infant: 1-23 months, Child, Preschool: 2-5 years, Child: 6-12 years, Adolescent: 13-18 years Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL Plus with Full Text	17,827
S8	S5 NOT S6	Limiters - Age Groups: Fetus, Conception to Birth, Infant, Newborn: birth-1 month, Infant: 1-23 months, Child, Preschool: 2-5 years, Child: 6-12 years, Adolescent: 13-18 years Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL Plus with Full Text	160
S7	S5 NOT S6	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL Plus with Full Text	996
S6	"diffusion tensor" OR "diffusion tensors"	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL Plus with Full Text	1,610
S5	S3 AND S4	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases	996

#	Query	Limiters/Expanders	Last Run Via	Results
			Search Screen - Advanced Search Database - CINAHL Plus with Full Text	
S4	"mental health" OR "mental illness" OR "mental disorders" OR "mental disorder" OR psychopathology OR "Adjustment Disorders" OR "adjustment disorder" OR "anxiety disorder" OR agoraphobia OR "panic disorder" OR (MH "Phobic Disorders+") OR phobia OR (MH "Stress Disorders, Post-Traumatic+") OR "posttraumatic stress disorder" OR "post-traumatic stress disorder" OR "generalized anxiety disorder" OR (MH "Obsessive-Compulsive Disorder+") OR "obsessive compulsive disorder" OR "reactive attachment disorder" OR (MH "Separation Anxiety") OR "separation anxiety disorder" OR (MH "Eating Disorders+") OR "eating disorder" OR "anorexia nervosa" OR "bulimia nervosa" OR (MH "Attention Deficit Hyperactivity Disorder") OR "attention deficit hyperactivity disorder" OR (MH "Attention Deficit Hyperactivity Disorder") OR "conduct disorder" OR "oppositional defiant disorder" OR depression OR "depressive disorder" OR (MH "Bipolar Disorder+") OR "bipolar disorder" OR mania OR "dysthymic disorder" OR schizophrenia OR (MH "Psychotic Disorders+") OR "psychotic disorder" OR encopresis OR (MH "Personality Disorders+") OR "personality disorder" OR "behavioral disorder" OR "behavioral disturbance" OR "serious emotional distress" OR "emotional disorder" OR (MH "Substance Use Disorders+") OR "Substance-Related Disorders" OR "substance use disorder" OR "drug use disorder" OR (MH "Alcohol-Related Disorders+") OR "alcohol use disorder" OR "alcohol dependence" OR alcoholism OR "drug dependence" OR "cannabis dependence" OR "marijuana dependence" OR "Tobacco Use Disorder" OR "nicotine dependence" OR	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL Plus with Full Text	409,260

#	Query	Limiters/Expanders	Last Run Via	Results
	"substance dependence" OR "substance abuse" OR "alcohol abuse" OR "drug abuse" OR "cannabis abuse" OR "marijuana abuse"			
S3	S1 OR S2	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL Plus with Full Text	1,133
S2	"social medicine"	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL Plus with Full Text	147
S1	(MH "Community Mental Health Services/AM")	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL Plus with Full Text	986

1/14/16 CINAHL

#	Query	Limiters/Expanders	Results
S26	S25	Limiters - Published Date: 20150701- Search modes - Boolean/Phrase	24
S25	S19 OR S21 OR S22	Narrow by Language: - english Narrow by SubjectAge: - all child Search modes - Boolean/Phrase	917
S24	S19 OR S21 OR S22	Narrow by SubjectAge: - all child Search modes - Boolean/Phrase	922
S23	S19 OR S21 OR S22	Search modes - Boolean/Phrase	4,359
S22	S12 not S13	Limiters - Publication Type: Review Search modes - Boolean/Phrase	1,206
S21	S14 and S20	Search modes - Boolean/Phrase	383
S20	(MH "Prospective Studies+") AND (prospective AND cohort)	Search modes - Boolean/Phrase	41,656
S19	S16 OR S18	Search modes - Boolean/Phrase	2,879
S18	S14 AND S17	Search modes - Boolean/Phrase	2,730
S17	((((randomized AND controlled) AND trial) OR (controlled AND trial)) OR ("controlled clinical trial" OR "single-blind method" OR "double-blind method" OR "random allocation")	Search modes - Boolean/Phrase	93,769
S16	S12 not S13	Limiters - Publication Type: Randomized Controlled Trial Search modes - Boolean/Phrase	1,037
S15	S12 not S13	Limiters - Publication Type: Editorial, Letter Search modes - Boolean/Phrase	430
S14	S12 not S13	Search modes - Boolean/Phrase	22,727
S13	"diffusion tensor" OR "diffusion tensors"	Search modes - Boolean/Phrase	1,617
S12	S10 AND S11	Search modes - Boolean/Phrase	22,736
S11	"mental health" OR "mental illness" OR "mental disorders" OR "mental disorder" OR psychopathology OR "Adjustment Disorders" OR "adjustment disorder" OR "anxiety disorder" OR agoraphobia OR "panic disorder" OR (MH "Phobic Disorders+") OR phobia OR (MH "Stress Disorders, Post-Traumatic+") OR "posttraumatic stress disorder" OR "post-traumatic stress disorder" OR "generalized anxiety disorder" OR (MH "Obsessive-Compulsive Disorder+") OR "obsessive compulsive disorder" OR "reactive attachment disorder" OR (MH "Separation Anxiety") OR "separation anxiety disorder" OR (MH "Eating Disorders+") OR "eating disorder" OR "anorexia nervosa" OR "bulimia nervosa" OR (MH "Attention Deficit Hyperactivity Disorder") OR "attention deficit hyperactivity disorder" OR (MH "Attention Deficit Hyperactivity Disorder") OR "conduct disorder" OR "oppositional defiant disorder" OR depression OR "depressive disorder" OR (MH "Bipolar Disorder+") OR "bipolar disorder" OR mania OR "dysthymic disorder" OR schizophrenia OR (MH "Psychotic Disorders+") OR "psychotic disorder" OR encopresis OR (MH "Personality Disorders+") OR "personality disorder" OR "behavioral disorder" OR "behavioral disturbance" OR "serious emotional distress" OR "emotional disorder" OR (MH "Substance Use Disorders+") OR "Substance-Related Disorders" OR "substance use disorder" OR "drug use disorder" OR (MH "Alcohol-Related	Search modes - Boolean/Phrase	410,207

#	Query	Limiters/Expanders	Results
	Disorders+") OR "alcohol use disorder" OR "alcohol dependence" OR alcoholism OR "drug dependence" OR "cannabis dependence" OR "marijuana dependence" OR "Tobacco Use Disorder" OR "nicotine dependence" OR "substance dependence" OR "substance abuse" OR "alcohol abuse" OR "drug abuse" OR "cannabis abuse" OR "marijuana abuse"		
S10	S6 or S9	Search modes - Boolean/Phrase	173,796
S9	S7 and S8	Search modes - Boolean/Phrase	130,730
S8	(MH "Guideline Adherence") OR (MH "Professional Practice, Evidence-Based+") OR "evidence based practice" OR "evidence-based practice" OR effect* OR evidence	Search modes - Boolean/Phrase	989,251
S7	"Patient Acceptance of Health Care" OR (MH "Pilot Studies") OR adaptation OR disseminat* OR (MH "Pilot Studies") OR feasibility OR fidelity OR implement* OR penetration OR supervision OR sustain* OR (MH "Information Systems+") OR uptake	Search modes - Boolean/Phrase	366,648
S6	(S1 OR S2 OR S3 OR S4 OR S5)	Search modes - Boolean/Phrase	48,221
S5	"social medicine"	Search modes - Boolean/Phrase	145
S4	(MH "Community Mental Health Services/AM")	Search modes - Boolean/Phrase	986
S3	"Information Dissemination" OR (MH "Diffusion of Innovation") OR (MH "Health Information Management")	Search modes - Boolean/Phrase	11,338
S2	"quality improvement" OR "quality initiative"	Search modes - Boolean/Phrase	36,363
S1	"Health Plan Implementation"	Search modes - Boolean/Phrase	3

12/2/14 PSYCINFO

#	Query	Limiters/Expanders	Last Run Via	Results
S20 S19		Limiters - English Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - PsycINFO	599
S19 S18		Limiters - Age Groups: Childhood (birth-12 yrs), Neonatal (birth-1 mo), Infancy (2-23 mo), Preschool Age (2-5 yrs), School Age (6- 12 yrs), Adolescence (13-17 yrs) Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - PsycINFO	613
S18 S13 OR S15 OR S17		Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - PsycINFO	4,382
S17 S12 AND S16		Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - PsycINFO	235
S16 (DE "Cohort Analysis") OR "cohort study" OR "cohort studies" or (prospective AND cohort)		Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - PsycINFO	14,911
S15 S12 AND S14		Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - PsycINFO	2,080
S14 ((randomized AND controlled) AND trial) OR (controlled AND trial) OR "controlled clinical trial" OR "Single-Blind Method" OR "Single- Blind Method" OR "Random Allocation"		Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - PsycINFO	30,733
S13 S12		Limiters - Methodology: LITERATURE REVIEW Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - PsycINFO	2,364
S12 S10 not S11		Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - PsycINFO	33,717
S11 "diffusion tensor" OR "diffusion tensors"		Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - PsycINFO	3,284
S10 S8 AND S9		Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search	33,730

#	Query	Limiters/Expanders	Last Run Via	Results
			Database - PsycINFO	
S9	("mental health" OR "mental illness" OR "mental disorders" OR "mental disorder" OR psychopathology OR "Adjustment Disorders"[Mesh] OR "adjustment disorder" OR "anxiety disorder" OR agoraphobia OR "panic disorder" OR (DE "Phobias" OR DE "Acrophobia" OR DE "Agoraphobia" OR DE "Claustrophobia" OR DE "Ophidiophobia" OR DE "School Phobia" OR DE "Social Phobia") OR phobia OR "posttraumatic stress disorder" OR "post-traumatic stress disorder" OR "generalized anxiety disorder" OR "Obsessive-Compulsive Disorder" OR "obsessive compulsive disorder" OR "reactive attachment disorder" OR "separation anxiety disorder" OR (DE "Eating Disorders" OR DE "Anorexia Nervosa" OR DE "Binge Eating Disorder" OR DE "Bulimia" OR DE "Hyperphagia" OR DE "Kleine Levin Syndrome" OR DE "Pica" OR DE "Purging (Eating Disorders)") OR "eating disorder" OR "eating disorders" OR "anorexia nervosa" OR "bulimia nervosa" OR (DE "Attention Deficit Disorder with Hyperactivity") OR "attention deficit hyperactivity disorder" OR "Attention Deficit and Disruptive Behavior Disorders" OR "conduct disorder" OR "oppositional defiant disorder" OR depression OR "depressive disorder" OR (DE "Bipolar Disorder" OR DE "Cyclothymic Personality") OR "bipolar disorder" OR mania OR "dysthymic disorder" OR (DE "Schizophrenia" OR DE "Acute Schizophrenia" OR DE "Catatonic Schizophrenia" OR DE "Childhood Schizophrenia" OR DE "Paranoid Schizophrenia" OR DE "Process Schizophrenia" OR DE "Schizophrenia (Disorganized Type)" OR DE "Schizophreniform Disorder" OR DE "Undifferentiated Schizophrenia") OR schizophrenia OR (DE "Psychoticism") OR "Psychotic Disorders" OR "psychotic disorder" OR encopresis OR (DE "Personality Disorders" OR DE "Antisocial Personality Disorder" OR DE "Avoidant Personality Disorder" OR DE "Borderline Personality Disorder"	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - PsycINFO	896,839

#	Query	Limiters/Expanders	Last Run Via	Results
	OR DE "Dependent Personality Disorder" OR DE "Histrionic Personality Disorder" OR DE "Narcissistic Personality Disorder" OR DE "Obsessive Compulsive Personality Disorder" OR DE "Paranoid Personality Disorder" OR DE "Passive Aggressive Personality Disorder" OR DE "Sadomasochistic Personality" OR DE "Schizoid Personality Disorder" OR DE "Schizotypal Personality Disorder") OR "personality disorder" OR "behavioral disorder" OR "behavioral disturbance" OR "serious emotional distress" OR "emotional disorder" OR "Substance-Related Disorders" OR "substance use disorder" OR "drug use disorder" OR (DE "Alcoholic Hallucinosi" OR DE "Delirium Tremens" OR DE "Korsakoffs Psychosis" OR DE "Wernicke's Syndrome" OR DE "Alcoholic Psychosis" OR DE "Alcoholic Hallucinosi" OR DE "Alcoholism" OR DE "Alcoholic Psychosis") OR "alcohol use disorder" OR "alcohol dependence" OR alcoholism OR "drug dependence" OR "cannabis dependence" OR "marijuana dependence" OR "Tobacco Use Disorder" OR "nicotine dependence" OR "substance dependence" OR "substance abuse" OR "alcohol abuse" OR "drug abuse" OR "cannabis abuse" OR "marijuana abuse"			
S8	S4 OR S7	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - PsycINFO	120,548
S7	S5 AND S6	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - PsycINFO	117,248
S6	Guideline Adherence OR Evidence-Based Practice OR "evidence based practice" OR effect* OR evidence	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - PsycINFO	1,233,597
S5	(Patient Acceptance of Health Care OR adaptation OR disseminat* OR Feasibility Studies OR feasibility OR fidelity OR implement* OR penetration OR supervision OR sustain* OR (DE "Information Systems" OR DE "Internet") OR	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - PsycINFO	286,703

#	Query	Limiters/Expanders	Last Run Via	Results
	uptake			
S4	S1 OR S2 OR S3	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - PsycINFO	4,536
S3	DE "Information Dissemination" OR "diffusion of innovation" OR "Health Information Management"	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - PsycINFO	1,581
S2	"Quality Improvement" OR "Quality Initiative"	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - PsycINFO	2,961
S1	"Health Plan Implementation"	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - PsycINFO	2

8/14/15 PSYCINFO

#	Query	Limiters/Expanders	Last Run Via	Results
S21	S20	Limiters - Published Date: 20140601- Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - PsycINFO	98
S20	S19	Limiters - Language: English Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - PsycINFO	691
S19	S18	Limiters - Age Groups: Childhood (birth-12 yrs), Neonatal (birth-1 mo), Infancy (2-23 mo), Preschool Age (2-5 yrs), School Age (6-12 yrs), Adolescence (13-17 yrs) Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - PsycINFO	705
S18	S13 OR S15 OR S17	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - PsycINFO	4,957
S17	S12 AND S16	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - PsycINFO	271
S16	(DE "Cohort Analysis") OR "cohort study" OR "cohort studies" or (prospective AND cohort)	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced	16,658

#	Query	Limiters/Expanders	Last Run Via	Results
			Search Database - PsycINFO	
S15	S12 AND S14	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - PsycINFO	2,414
S14	((randomized AND controlled) AND trial) OR (controlled AND trial) OR "controlled clinical trial" OR "Single-Blind Method" OR "Single-Blind Method" OR "Random Allocation"	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - PsycINFO	33,684
S13	S12	Limiters - Methodology: LITERATURE REVIEW Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - PsycINFO	2,617
S12	S10 not S11	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - PsycINFO	36,841
S11	"diffusion tensor" OR "diffusion tensors"	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - PsycINFO	3,859
S10	S8 AND S9	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - PsycINFO	36,857
S9	("mental health" OR "mental illness" OR "mental disorders" OR "mental disorder" OR psychopathology OR "Adjustment Disorders"[Mesh] OR "adjustment disorder" OR "anxiety disorder" OR agoraphobia OR "panic disorder" OR (DE "Phobias" OR DE "Acrophobia" OR DE "Agoraphobia" OR DE "Claustrophobia" OR DE "Ophidiophobia" OR DE "School Phobia" OR DE "Social Phobia") OR phobia OR "posttraumatic stress disorder" OR "post-traumatic stress disorder" OR "generalized anxiety disorder" OR "Obsessive-Compulsive Disorder" OR "obsessive compulsive disorder" OR "reactive attachment disorder" OR "separation anxiety disorder" OR (DE "Eating Disorders" OR DE "Anorexia Nervosa" OR DE "Binge Eating Disorder" OR DE "Bulimia" OR DE "Hyperphagia" OR DE "Kleine Levin Syndrome" OR DE "Pica" OR DE "Purging (Eating Disorders)") OR "eating disorder" OR "eating disorders" OR "anorexia nervosa" OR "bulimia nervosa" OR (DE "Attention Deficit Disorder with Hyperactivity") OR "attention deficit hyperactivity disorder"	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - PsycINFO	946,411

#	Query	Limiters/Expanders	Last Run Via	Results
	OR "Attention Deficit and Disruptive Behavior Disorders" OR "conduct disorder" OR "oppositional defiant disorder" OR depression OR "depressive disorder" OR (DE "Bipolar Disorder" OR DE "Cyclothymic Personality") OR "bipolar disorder" OR mania OR "dysthymic disorder" OR (DE "Schizophrenia" OR DE "Acute Schizophrenia" OR DE "Catatonic Schizophrenia" OR DE "Childhood Schizophrenia" OR DE "Paranoid Schizophrenia" OR DE "Process Schizophrenia" OR DE "Schizophrenia (Disorganized Type)" OR DE "Schizophreniform Disorder" OR DE "Undifferentiated Schizophrenia") OR schizophrenia OR (DE "Psychoticism") OR "Psychotic Disorders" OR "psychotic disorder" OR encopresis OR (DE "Personality Disorders" OR DE "Antisocial Personality Disorder" OR DE "Avoidant Personality Disorder" OR DE "Borderline Personality Disorder" OR DE "Dependent Personality Disorder" OR DE "Histrionic Personality Disorder" OR DE "Narcissistic Personality Disorder" OR DE "Obsessive Compulsive Personality Disorder" OR DE "Paranoid Personality Disorder" OR DE "Passive Aggressive Personality Disorder" OR DE "Sadomasochistic Personality" OR DE "Schizoid Personality Disorder" OR DE "Schizotypal Personality Disorder") OR "personality disorder" OR "behavioral disorder" OR "behavioral disturbance" OR "serious emotional distress" OR "emotional disorder" OR "Substance-Related Disorders" OR "substance use disorder" OR "drug use disorder" OR (DE "Alcoholic Hallucinosi" OR DE "Delirium Tremens" OR DE "Korsakoffs Psychosis" OR DE "Wernicke's Syndrome" OR DE "Alcoholic Psychosis" OR DE "Alcoholic Hallucinosi" OR DE "Alcoholism" OR DE "Alcoholic Psychosis") OR "alcohol use disorder" OR "alcohol dependence" OR alcoholism OR "drug dependence" OR "cannabis dependence" OR "marijuana dependence" OR "Tobacco Use Disorder" OR "nicotine dependence" OR "substance dependence" OR "substance abuse" OR "alcohol abuse" OR "drug abuse" OR "cannabis abuse" OR "marijuana abuse"			
S8	S4 OR S7	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - PsycINFO	130,347
S7	S5 AND S6	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases	126,757

#	Query	Limiters/Expanders	Last Run Via	Results
			Search Screen - Advanced Search Database - PsycINFO	
S6	Guideline Adherence OR Evidence-Based Practice OR "evidence based practice" OR effect* OR evidence	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - PsycINFO	1,301,208
S5	(Patient Acceptance of Health Care OR adaptation OR disseminat* OR Feasibility Studies OR feasibility OR fidelity OR implement* OR penetration OR supervision OR sustain* OR (DE "Information Systems" OR DE "Internet") OR uptake	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - PsycINFO	306,677
S4	S1 OR S2 OR S3	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - PsycINFO	4,927
S3	DE "Information Dissemination" OR "diffusion of innovation" OR "Health Information Management"	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - PsycINFO	1,707
S2	"Quality Improvement" OR "Quality Initiative"	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - PsycINFO	3,226
S1	"Health Plan Implementation"	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - PsycINFO	3

12/10/15 PsycInfo Add on Search

#	Query	Limiters/Expanders	Last Run Via	Results
S14	S12 OR S13	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - PsycINFO	110
S13	S8	Limiters - Document Type: Review-Any Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - PsycINFO	10
S12	S8 AND S11	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - PsycINFO	90
S11	S9 OR S10	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - PsycINFO	9,679
S10	(DE "Cohort Analysis") OR "cohort study" OR "cohort studies" or (prospective AND cohort)	Limiters - Age Groups: Childhood (birth-12 yrs), Neonatal (birth-1 mo), Infancy (2-23 mo), Preschool Age (2-5 yrs), School Age (6-12 yrs), Adolescence (13-17 yrs) Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - PsycINFO	4,546
S9	(randomized AND controlled) AND trial) OR (controlled AND trial) OR "controlled clinical trial" OR "Single-Blind Method" OR "Single-Blind Method" OR "Random Allocation"	Limiters - Age Groups: Childhood (birth-12 yrs), Neonatal (birth-1 mo), Infancy (2-23 mo), Preschool Age (2-5 yrs), School Age (6-12 yrs), Adolescence (13-17 yrs) Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - PsycINFO	5,172
S8	S5 NOT S6	Limiters - Age Groups: Childhood (birth-12 yrs), Neonatal (birth-1 mo), Infancy (2-23 mo), Preschool Age (2-5 yrs), School Age (6-12 yrs), Adolescence (13-17 yrs) Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - PsycINFO	1,520
S7	S5 NOT S6	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - PsycINFO	9,553
S6	"diffusion tensor" OR "diffusion tensors"	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - PsycINFO	4,077
S5	S3 AND S4	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases	9,555

#	Query	Limiters/Expanders	Last Run Via	Results
			Search Screen - Advanced Search Database - PsycINFO	
S4	("mental health" OR "mental illness" OR "mental disorders" OR "mental disorder" OR psychopathology OR "Adjustment Disorders"[Mesh] OR "adjustment disorder" OR "anxiety disorder" OR agoraphobia OR "panic disorder" OR (DE "Phobias" OR DE "Acrophobia" OR DE "Agoraphobia" OR DE "Claustrophobia" OR DE "Ophidiophobia" OR DE "School Phobia" OR DE "Social Phobia") OR phobia OR "posttraumatic stress disorder" OR "post-traumatic stress disorder" OR "generalized anxiety disorder" OR "Obsessive-Compulsive Disorder" OR "obsessive compulsive disorder" OR "reactive attachment disorder" OR "separation anxiety disorder" OR (DE "Eating Disorders" OR DE "Anorexia Nervosa" OR DE "Binge Eating Disorder" OR DE "Bulimia" OR DE "Hyperphagia" OR DE "Kleine Levin Syndrome" OR DE "Pica" OR DE "Purging (Eating Disorders)") OR "eating disorder" OR "eating disorders" OR "anorexia nervosa" OR "bulimia nervosa" OR (DE "Attention Deficit Disorder with Hyperactivity") OR "attention deficit hyperactivity disorder" OR "Attention Deficit and Disruptive Behavior Disorders" OR "conduct disorder" OR "oppositional defiant disorder" OR depression OR "depressive disorder" OR (DE "Bipolar Disorder" OR DE "Cyclothymic Personality") OR "bipolar disorder" OR mania OR "dysthymic disorder" OR (DE "Schizophrenia" OR DE "Acute Schizophrenia" OR DE "Catatonic Schizophrenia" OR DE "Childhood Schizophrenia" OR DE "Paranoid Schizophrenia" OR DE "Process Schizophrenia" OR DE "Schizophrenia (Disorganized Type)" OR DE "Schizophreniform Disorder" OR DE "Undifferentiated Schizophrenia") OR schizophrenia OR (DE "Psychoticism") OR "Psychotic Disorders" OR "psychotic disorder" OR encopresis OR (DE "Personality Disorders" OR DE "Antisocial Personality Disorder" OR DE	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - PsycINFO	957,493

#	Query	Limiters/Expanders	Last Run Via	Results
	"Avoidant Personality Disorder" OR DE "Borderline Personality Disorder" OR DE "Dependent Personality Disorder" OR DE "Histrionic Personality Disorder" OR DE "Narcissistic Personality Disorder" OR DE "Obsessive Compulsive Personality Disorder" OR DE "Paranoid Personality Disorder" OR DE "Passive Aggressive Personality Disorder" OR DE "Sadomasochistic Personality" OR DE "Schizoid Personality Disorder" OR DE "Schizotypal Personality Disorder") OR "personality disorder" OR "behavioral disorder" OR "behavioral disturbance" OR "serious emotional distress" OR "emotional disorder" OR "Substance-Related Disorders" OR "substance use disorder" OR "drug use disorder" OR (DE "Alcoholic Hallucinosi" OR DE "Delirium Tremens" OR DE "Korsakoffs Psychosis" OR DE "Wernicke's Syndrome" OR DE "Alcoholic Psychosis" OR DE "Alcoholic Hallucinosi" OR DE "Alcoholism" OR DE "Alcoholic Psychosis") OR "alcohol use disorder" OR "alcohol dependence" OR alcoholism OR "drug dependence" OR "cannabis dependence" OR "marijuana dependence" OR "Tobacco Use Disorder" OR "nicotine dependence" OR "substance dependence" OR "substance abuse" OR "alcohol abuse" OR "drug abuse" OR "cannabis abuse" OR "marijuana abuse"			
S3	S1 OR S2	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - PsycINFO	13,312
S2	"social medicine"	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - PsycINFO	6,485
S1	DE "Community Mental Health Services"	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - PsycINFO	6,834

1/14/16 PSYCINFO

#	Query	Limiters/Expanders	Results
S23	S22	Limiters - Published Date: 20150701-	33

#	Query	Limiters/Expanders	Results
		Search modes - Boolean/Phrase	
S22	S21	Limiters - English	794
		Search modes - Boolean/Phrase	
S21	S20	Limiters - Age Groups: Childhood (birth-12 yrs), Neonatal (birth-1 mo), Infancy (2-23 mo), Preschool Age (2-5 yrs), School Age (6-12 yrs), Adolescence (13-17 yrs)	811
		Search modes - Boolean/Phrase	
S20	S15 OR S17 OR S19	Search modes - Boolean/Phrase	5,765
S19	S14 AND S18	Search modes - Boolean/Phrase	435
S18	(DE "Cohort Analysis") OR "cohort study" OR "cohort studies" or (prospective AND cohort)	Search modes - Boolean/Phrase	14,371
	S16		
S17	S14 AND S16	Search modes - Boolean/Phrase	2,702
S16	((randomized AND controlled) AND trial) OR (controlled AND trial) OR "controlled clinical trial" OR "Single-Blind Method" OR "Single-Blind Method" OR "Random Allocation"	Search modes - Boolean/Phrase	35,396
S15	S12 not S13	Limiters - Methodology: LITERATURE REVIEW	3,025
		Search modes - Boolean/Phrase	
S14	S12 not S13	Search modes - Boolean/Phrase	47,185
S13	"diffusion tensor" OR "diffusion tensors"	Search modes - Boolean/Phrase	4,126
S12	S10 AND S11	Search modes - Boolean/Phrase	47,203
S11	("mental health" OR "mental illness" OR "mental disorders" OR "mental disorder" OR psychopathology OR "Adjustment Disorders"[Mesh] OR "adjustment disorder" OR "anxiety disorder" OR agoraphobia OR "panic disorder" OR (DE "Phobias" OR DE "Acrophobia" OR DE "Agoraphobia" OR DE "Claustrophobia" OR DE "Ophidiophobia" OR DE "School Phobia" OR DE "Social Phobia") OR phobia OR "posttraumatic stress disorder" OR "post-traumatic stress disorder" OR "generalized anxiety disorder" OR "Obsessive-Compulsive Disorder" OR "obsessive compulsive disorder" OR "reactive attachment disorder" OR "separation anxiety disorder" OR (DE "Eating Disorders" OR DE "Anorexia Nervosa" OR DE "Binge Eating Disorder" OR DE "Bulimia" OR DE "Hyperphagia" OR DE "Kleine Levin Syndrome" OR DE "Pica" OR DE "Purging (Eating Disorders)") OR "eating disorder" OR "eating disorders" OR "anorexia nervosa" OR "bulimia nervosa" OR (DE "Attention Deficit Disorder with Hyperactivity") OR "attention deficit hyperactivity disorder" OR "Attention Deficit and Disruptive Behavior Disorders" OR "conduct disorder" OR "oppositional defiant disorder" OR depression OR "depressive disorder" OR (DE "Bipolar Disorder" OR DE "Cyclothymic Personality") OR "bipolar disorder" OR mania OR "dysthymic disorder" OR (DE "Schizophrenia" OR DE "Acute Schizophrenia" OR DE "Catatonic Schizophrenia" OR DE "Childhood Schizophrenia" OR DE "Paranoid Schizophrenia" OR DE "Process	Search modes - Boolean/Phrase	961,296

#	Query	Limiters/Expanders	Results
	Schizophrenia" OR DE "Schizophrenia (Disorganized Type)" OR DE "Schizophreniform Disorder" OR DE "Undifferentiated Schizophrenia") OR schizophrenia OR (DE "Psychoticism") OR "Psychotic Disorders" OR "psychotic disorder" OR encopresis OR (DE "Personality Disorders" OR DE "Antisocial Personality Disorder" OR DE "Avoidant Personality Disorder" OR DE "Borderline Personality Disorder" OR DE "Dependent Personality Disorder" OR DE "Histrionic Personality Disorder" OR DE "Narcissistic Personality Disorder" OR DE "Obsessive Compulsive Personality Disorder" OR DE "Paranoid Personality Disorder" OR DE "Passive Aggressive Personality Disorder" OR DE "Sadomasochistic Personality" OR DE "Schizoid Personality Disorder" OR DE "Schizotypal Personality Disorder") OR "personality disorder" OR "behavioral disorder" OR "behavioral disturbance" OR "serious emotional distress" OR "emotional disorder" OR "Substance-Related Disorders" OR "substance use disorder" OR "drug use disorder" OR (DE "Alcoholic Hallucinoses" OR DE "Delirium Tremens" OR DE "Korsakoffs Psychosis" OR DE "Wernicke's Syndrome" OR DE "Alcoholic Psychosis" OR DE "Alcoholic Hallucinoses" OR DE "Alcoholism" OR DE "Alcoholic Psychosis") OR "alcohol use disorder" OR "alcohol dependence" OR alcoholism OR "drug dependence" OR "cannabis dependence" OR "marijuana dependence" OR "Tobacco Use Disorder" OR "nicotine dependence" OR "substance dependence" OR "substance abuse" OR "alcohol abuse" OR "drug abuse" OR "cannabis abuse" OR "marijuana abuse"		
S10	S6 OR S9	Search modes - Boolean/Phrase	148,469
S9	S7 AND S8	Search modes - Boolean/Phrase	132,235
S8	Guideline Adherence OR Evidence-Based Practice OR "evidence based practice" OR effect* OR evidence	Search modes - Boolean/Phrase	1,337,708
S7	(Patient Acceptance of Health Care OR adaptation OR disseminat* OR Feasibility Studies OR feasibility OR fidelity OR implement* OR penetration OR supervision OR sustain* OR (DE "Information Systems" OR DE "Internet") OR uptake	Search modes - Boolean/Phrase	318,270
S6	S1 or S2 or S3 or S4 or S5	Search modes - Boolean/Phrase	18,565
S5	"social medicine"	Search modes - Boolean/Phrase	6,518
S4	DE "Community Mental Health Services"	Search modes - Boolean/Phrase	6,846
S3	DE "Information Dissemination" OR "diffusion of innovation" OR "Health Information Management"	Search modes - Boolean/Phrase	1,796
S2	"Quality Improvement" OR "Quality Initiative"	Search modes - Boolean/Phrase	3,477
S1	"Health Plan Implementation"	Search modes - Boolean/Phrase	4

Grey Literature searches

5/7/15 ClinicalTrials.gov

174 studies found for:

"Health Plan Implementation" OR "Quality Improvement" OR "quality initiative" OR "Information Dissemination" OR "Diffusion of Innovation" OR "Health Information Management" | mental OR anxiety OR posttraumatic OR post-traumatic OR substance OR depression OR depressive OR bipolar OR eating disorder OR eating disorders OR anorexia OR bulimia OR psychotic OR psychosis OR Attention Deficit OR ADHD OR conduct disorder | Child

131 studies found for:

("Patient Acceptance of Health Care" OR adaptation OR disseminat*OR "Feasibility Studies" OR feasibility OR fidelity OR implement* OR penetration OR supervision OR sustain* OR "Information Systems" OR uptake) AND (guideline* OR evidence OR effect*) | mental OR anxiety OR posttraumatic OR post-traumatic OR substance OR depression OR depressive OR bipolar OR eating disorder OR eating disorders OR anorexia OR bulimia OR psychotic OR psychosis OR Attention Deficit OR ADHD OR conduct disorder | Child

8/17/15 ClinicalTrials.gov

5 studies found for:

"Health Plan Implementation" OR "Quality Improvement" OR "quality initiative" OR "Information Dissemination" OR "Diffusion of Innovation" OR "Health Information Management" | mental OR anxiety OR posttraumatic OR post-traumatic OR substance OR depression OR depressive OR bipolar OR eating disorder OR eating disorders OR anorexia OR bulimia OR psychotic OR psychosis OR Attention Deficit OR ADHD OR conduct disorder | Child | received from 05/07/2015 to 08/17/2015

6 studies found for:

("Patient Acceptance of Health Care" OR adaptation OR disseminat*OR "Feasibility Studies" OR feasibility OR fidelity OR implement* OR penetration OR supervision OR sustain* OR "Information Systems" OR uptake) AND (guideline* OR evidence OR effect*) | mental OR anxiety OR posttraumatic OR post-traumatic OR substance OR depression OR depressive OR bipolar OR eating disorder OR eating disorders OR anorexia OR bulimia OR psychotic OR psychosis OR Attention Deficit OR ADHD OR conduct disorder | Child | received from 05/07/2015 to 08/17/2015

12/16/15 ClinicalTrials.gov Add on Search

20 studies found for:

In main search terms box: "Community Mental Health" OR "social medicine"

MH Terms in Condition box: mental OR anxiety OR posttraumatic OR post-traumatic OR substance OR depression OR depressive OR bipolar OR eating disorder OR eating disorders OR anorexia OR bulimia OR psychotic OR psychosis OR Attention Deficit OR ADHD OR conduct disorder

Limit to Child

1/19/2016 and 1/21/2016 ClinicalTrials.gov

64 results found:

"Health Plan Implementation" OR "Quality Improvement" OR "quality initiative" OR "Information Dissemination" OR "Diffusion of Innovation" OR "Health Information Management" OR "Community Mental Health" OR "social medicine" | mental OR anxiety OR posttraumatic OR post-traumatic OR substance OR depression OR depressive OR bipolar OR eating disorder OR eating disorders OR anorexia OR bulimia OR psychotic OR psychosis OR Attention Deficit OR ADHD OR conduct disorder | Child | updated on or after 07/15/2015

39 results found:

("Patient Acceptance of Health Care" OR adaptation OR disseminat*OR "Feasibility Studies" OR feasibility OR fidelity OR implement* OR penetration OR supervision OR sustain* OR "Information Systems" OR uptake) AND (guideline* OR evidence OR effect*) | mental OR anxiety OR posttraumatic

OR post-traumatic OR substance OR depression OR depressive OR bipolar OR eating disorder OR eating disorders OR anorexia OR bulimia OR psychotic OR psychosis OR Attention Deficit OR ADHD OR conduct disorder | Child | updated on or after 07/15/2015

5/8/15 WHO ICTRP

Character limits present and unable to use parentheses or quotes, or mix AND and OR in the same search box.

Modified searches:

QI search

In Title:

Health Plan Implementation OR Quality Improvement OR quality OR Diffusion

In Condition:

mental OR anxiety OR posttraumatic OR post-traumatic OR substance OR depression OR depressive OR bipolar OR eating disorder OR eating disorders OR anorexia OR bulimia OR psychotic OR psychosis
Limited to trials in children

1 results for 30 trials

"EBM search" (could not include the AND for EMB terms so the results will have to be reviewed to see if any qualify)

In Title:

Patient Acceptance OR adaptation OR disseminat* OR feasibility OR fidelity OR implement* OR Information OR uptake

In Condition:

mental OR anxiety OR posttraumatic OR post-traumatic OR substance OR depression OR depressive OR bipolar OR eating disorder OR eating disorders OR anorexia OR bulimia OR psychotic OR psychosis
Limited to search for clinical trials in children.

69 records for 66 trials

8/17/15 WHO ICTRP

Character limits present and unable to use parentheses or quotes, or mix AND and OR in the same search box. Modified searches:

QI search

In Title:

Health Plan Implementation OR Quality Improvement OR quality OR Diffusion

In Condition:

mental OR anxiety OR posttraumatic OR post-traumatic OR substance OR depression OR depressive OR bipolar OR eating disorder OR eating disorders OR anorexia OR bulimia OR psychotic OR psychosis
Limited to trials in children

Dates: May 8, 2015 – Aug 17, 2015

results for 8 trials

"EBM search" (could not include the AND for EMB terms so the results will have to be reviewed to see if any qualify)

In Title:

Patient Acceptance OR adaptation OR disseminat* OR feasibility OR fidelity OR implement* OR Information OR uptake

In Condition:

mental OR anxiety OR posttraumatic OR post-traumatic OR substance OR depression OR depressive OR bipolar OR eating disorder OR eating disorders OR anorexia OR bulimia OR psychotic OR psychosis
Limited to search for clinical trials in children.

Dates: May 8, 2015 – Aug 17, 2015

8 records for 8 trials

12/15/15 WHO ICTRP Add on Search

In title box: Community Mental Health OR social medicine

In condition box: mental OR anxiety OR posttraumatic OR post-traumatic OR substance OR depression OR depressive OR bipolar OR eating disorder OR eating disorders OR anorexia OR bulimia OR psychotic OR psychosis

Limited to search for clinical trials in children.

Recruitment status ALL.

1 Result

1/19/2016 and 1/21/2016 WHO ICTRP

QI Search

2 results found:

(In title): Health Plan Implementation OR Quality Improvement OR quality OR Diffusion OR Community Mental Health OR social medicine

(In condition): mental OR anxiety OR posttraumatic OR post-traumatic OR substance OR depression OR depressive OR bipolar OR eating disorder OR eating disorders OR anorexia OR bulimia OR psychotic OR psychosis

Limited to trials in children

Recruitment is ALL

Date of registration is 07/15/2015 -

EBM Search

1 result found:

(In title): Patient Acceptance OR adaptation OR disseminat* OR feasibility OR fidelity OR implement* OR Information OR uptake

(In condition): mental OR anxiety OR posttraumatic OR post-traumatic OR substance OR depression OR depressive OR bipolar OR eating disorder OR eating disorders OR anorexia OR bulimia OR psychotic OR psychosis

Limited to trials in children

Recruitment is ALL

Date of registration is 07/15/2015 –

5/13/15 NIH RePORTER

((("Health Plan Implementation" OR "Quality Improvement" OR "quality initiative" OR "Information Dissemination" OR "Diffusion of Innovation" OR "Health Information Management") OR ("Patient Acceptance of Health Care" OR adaptation OR disseminat OR "Feasibility Studies" OR feasibility OR fidelity OR implement OR penetration OR supervision OR sustain OR "Information Systems" OR uptake) AND ("Guideline Adherence" OR evidence OR effect))) AND (mental OR anxiety OR posttraumatic OR post-traumatic OR substance OR depression OR depressive OR bipolar OR eating disorder OR eating disorders OR anorexia OR bulimia OR psychotic OR psychosis) AND (child or children or teen or teens or teenage or teenaged or adolescen or pediatric or paediatric or boys or girls or youth or youths) AND (randomized AND controlled AND trial) OR (controlled AND trial) OR ("controlled clinical trial" OR "single-blind method" OR "double-blind method" OR "random allocation")

8/18/15 NIH RePORTER

((("Health Plan Implementation" OR "Quality Improvement" OR "quality initiative" OR "Information Dissemination" OR "Diffusion of Innovation" OR "Health Information Management") OR ("Patient Acceptance of Health Care" OR adaptation OR disseminat* OR "Feasibility Studies" OR feasibility OR fidelity OR implement OR penetration OR supervision OR sustain OR "Information Systems" OR uptake) AND ("Guideline Adherence" OR evidence OR effect)) AND (mental OR anxiety OR posttraumatic OR post-traumatic OR substance OR depression OR depressive OR bipolar OR "eating disorder" OR "eating

disorders" OR anorexia OR bulimia OR psychotic OR psychosis) AND (child or children or teen or teens or teenage or teenaged or adolescen* or pediatric or paediatric or boys or girls or youth or youths) AND ((randomized AND controlled AND trial) OR (controlled AND trial) OR ("controlled clinical trial" OR "single-blind method" OR "double-blind method" OR "random allocation"))**Limited to 5-1-15 to 8-17-15**

12/15/15 NIH RePorter Add on Search

("Community Mental Health" OR "social medicine") AND (mental OR anxiety OR posttraumatic OR post-traumatic OR substance OR depression OR depressive OR bipolar OR "eating disorder" OR "eating disorders" OR anorexia OR bulimia OR psychotic OR psychosis) AND (child or children or teen or teens or teenage or teenaged or adolescen* or pediatric or paediatric or boys or girls or youth or youths) AND ((randomized AND controlled AND trial) OR (controlled AND trial) OR ("controlled clinical trial" OR "single-blind method" OR "double-blind method" OR "random allocation"))

1/21/2016 NIH Reporter

Limited to Award Notice Date > 7/15/2015

((("Health Plan Implementation" OR "Quality Improvement" OR "quality initiative" OR "Information Dissemination" OR "Diffusion of Innovation" OR "Health Information Management" OR "Community Mental Health" OR "social medicine") OR (("Patient Acceptance of Health Care" OR adaptation OR disseminat OR "Feasibility Studies" OR feasibility OR fidelity OR implement OR penetration OR supervision OR sustain OR "Information Systems" OR uptake) AND ("Guideline Adherence" OR evidence OR effect))) AND (mental OR anxiety OR posttraumatic OR post-traumatic OR substance OR depression OR depressive OR bipolar OR eating disorder OR eating disorders OR anorexia OR bulimia OR psychotic OR psychosis) AND (child or children or teen or teens or teenage or teenaged or adolescen or pediatric or paediatric or boys or girls or youth or youths) AND ((randomized AND controlled AND trial) OR (controlled AND trial) OR ("controlled clinical trial" OR "single-blind method" OR "double-blind method" OR "random allocation"))

5/8/15 DoPHER

((("Health Plan Implementation" OR "Quality Improvement" OR "quality initiative" OR "Information Dissemination" OR "Diffusion of Innovation" OR "Health Information Management") OR (("Patient Acceptance of Health Care" OR adaptation OR disseminat* OR "Feasibility Studies" OR feasibility OR fidelity OR implement* OR penetration OR supervision OR sustain* OR "Information Systems" OR uptake) AND ("Guideline Adherence" OR evidence OR effect*))) AND (mental OR anxiety OR posttraumatic OR post-traumatic OR substance OR depression OR depressive OR bipolar OR eating disorder OR eating disorders OR anorexia OR bulimia OR psychotic OR psychosis OR Attention Deficit OR ADHD OR conduct disorder OR schizophrenia OR panic OR phobic OR phobia OR obsessive compulsive OR reactive attachment OR oppositional defiant disorder OR mania OR dysthymic OR psychotic OR encopresis OR personality OR behavioral OR emotional OR Substance-Related OR substance use OR drug use OR alcoholism OR drug dependence OR cannabis OR marijuana OR Tobacco OR nicotine OR alcohol OR Adjustment OR agoraphobia)

8/17/15 DoPHER

((("Health Plan Implementation" OR "Quality Improvement" OR "quality initiative" OR "Information Dissemination" OR "Diffusion of Innovation" OR "Health Information Management") OR (("Patient Acceptance of Health Care" OR adaptation OR disseminat* OR "Feasibility Studies" OR feasibility OR fidelity OR implement* OR penetration OR supervision OR sustain* OR "Information Systems" OR uptake) AND ("Guideline Adherence" OR evidence OR effect*))) AND (mental OR anxiety OR posttraumatic OR post-traumatic OR substance OR depression OR depressive OR bipolar OR eating disorder OR eating disorders OR anorexia OR bulimia OR psychotic OR psychosis OR Attention Deficit OR ADHD OR conduct disorder OR schizophrenia OR panic OR phobic OR phobia OR obsessive compulsive OR reactive attachment OR oppositional defiant disorder OR mania OR dysthymic OR psychotic OR encopresis OR personality OR behavioral OR emotional OR Substance-Related OR substance use OR drug use OR alcoholism OR drug dependence OR cannabis OR marijuana OR Tobacco OR nicotine OR alcohol OR Adjustment OR agoraphobia)

12/16/15 DoPHER Add on Search

(Community Mental Health OR social medicine) AND (mental OR anxiety OR posttraumatic OR post-traumatic OR substance OR depression OR depressive OR bipolar OR eating disorder OR eating disorders OR anorexia OR bulimia OR psychotic OR psychosis OR Attention Deficit OR ADHD OR conduct disorder OR schizophrenia OR panic OR phobic OR phobia OR obsessive compulsive OR reactive attachment OR oppositional defiant disorder OR mania OR dysthymic OR psychotic OR encopresis OR personality OR behavioral OR emotional OR Substance-Related OR substance use OR drug use OR alcoholism OR drug dependence OR cannabis OR marijuana OR Tobacco OR nicotine OR alcohol OR Adjustment OR agoraphobia) – Search did not produce results in Free-text or Title search
Tried:

"Community Mental Health" OR "social medicine" in Title gave 1 result and it was about adults.

1/21/2016 and 1/22/2016 DoPHER

Longer search (same as for RePORTER) – 0 results

Database would not return results unless the search was one word.

5/8/15 CMS.gov

"Health Plan Implementation" "Quality Improvement" "quality initiative" "Information Dissemination" "Diffusion of Innovation" "Health Information Management" site:cms.gov

Results were too numerous (5000+) so I searched visually for publications on the CMS website and identified 14 publications.

Search in Innovation Center for "child" (9), "mental"(3)

Browsed Innovation Center Data and reports since they were not that numerous and found 2 reports about mental health.

8/18/15 CMS.gov

Search on CMS.gov doesn't yield results, and Google search with CMS.gov as domain is also large. Results were too numerous (5000+) so I searched visually for publications on the CMS website and identified 0 new publications.

Search in Innovation Center for "child" (9), "mental"(3); same results as last time; did not save.

12/15/15/ CMS.gov Add on Search

Search on CMS.gov doesn't yield results, and Google search with CMS.gov as domain is also large. Results were too numerous (1900+) so I searched visually for publications on the CMS website and identified 0 publications about children.

Searched in Innovation Center and there were no results.

1/21/16 CMS.gov

CMS.gov main site:

((("Health Plan Implementation" OR "Quality Improvement" OR "quality initiative" OR "Information Dissemination" OR "Diffusion of Innovation" OR "Health Information Management" OR "community mental health services" OR "social medicine") OR ("Patient Acceptance of Health Care" OR adaptation OR disseminat* OR "Feasibility Studies" OR feasibility OR fidelity OR implement OR penetration OR supervision OR sustain OR "Information Systems" OR uptake) AND ("Guideline Adherence" OR evidence OR effect)) AND (mental OR anxiety OR posttraumatic OR post-traumatic OR substance OR depression OR depressive OR bipolar OR "eating disorder" OR "eating disorders" OR anorexia OR bulimia OR psychotic OR psychosis) AND (child or children or teen or teens or teenage or teenaged or adolescent* or pediatric or paediatric or boys or girls or youth or youths) AND ((randomized AND controlled AND trial) OR (controlled AND trial) OR ("controlled clinical trial" OR "single-blind method" OR "double-blind method" OR "random allocation"))

~2350 results, not saved

Google Advanced Search for domain CMS.gov

Using just condition terms in the "any of these words" search box and updated in the past year:

mental OR anxiety OR posttraumatic OR post-traumatic OR substance OR depression OR depressive OR bipolar OR "eating disorder" OR "eating disorders" OR anorexia OR bulimia OR psychotic OR psychosis

Changed to remove ORs since Google puts them in

mental anxiety posttraumatic post-traumatic substance depression depressive bipolar "eating disorder" "eating disorders" anorexia OR bulimia psychotic psychosis

0 results

Visually reviewing relevant tabs on CMS.gov

Searched the Research, Statistics, Data & Systems tab of the CMS website looking for publications in Research Reports - searched the 293 publications listed again for the condition terms (individually, the OR statement did not return results) and did not find anything.

Searched Innovation Center tab (Data and Reports section) for "child" (9), "mental"(3); same results as last time; did not save.

Searches Conducted to Obtain Additional Information on Included Interventions

10/14/15 SIMHC extra searches for intervention names in PubMed:

"availability, responsiveness, and continuity" - 12, all imported

"chica system" - 8, all imported

"Contextualized Feedback Systems" - 7, all imported

"Coping Power—training plus feedback"[all fields] OR "cp-tf"[all fields] OR "Coping Power—basic training"[all fields] OR "cp-bt" [all fields] - 12, all imported

"Intensive Quality Assurance" – 7, all imported

"metabolic monitoring training program"[all fields] - 1

P4P - 354 - 353 imported, 1 duplicate discarded.

10/14/15 SIMHC extra searches for author names in PubMed:

Searched Last Name, First and Middle Initials (if known) OR Last Name, First Name. (Except for H Lester, which produced 520 results. "Helen Lester" produced 99 results.)

Bauer NS

Beidas RS

Bickman L

Birchwood M

Boxmeyer C

Carroll AE

Edmunds JM

Epstein JN

Garner BR

Glisson C

Godley SH

Gully KJ

Hemmelgarn A

Henggeler SW

Kelley SD

Langberg JM

Langkamp DL

Lester Helen

Lochman JE

Price BL

Rabiner D

Rayter M

Ronsley R

Schoenwald SK

Sheidow AJ

Sterling S

Wildman BG

Appendix B. Effective Practice and Organization of Care Taxonomy Tables

Table B-1. SIMHC intervention EPOC taxonomy table, professional components

Study, Yr Arm Strategy	Distribution of Educational Materials ^a	Educational Meetings ^b	Local Consensus Processes ^c	Educational Outreach Visits ^d	Patient- Mediated Interventions ^e	Audit and Feedback ^f	Reminders ^g	Marketing ^h	Other ⁱ
Beidas et al., 2012 ¹ Arm 1 Augmented Training	--	6-hr experiential workshop focused on core CBT principles, behavioral role-play, and interteaching that included small gp activities ^j	--	--	--	--	--	--	Wkly consultation via virtual conferencing platform for 3 mths after training (phone or via computer) to attend 1-hr wkly virtual gp mtgs
Beidas et al., 2012 ¹ Arm 2 Computer Training	6-hr computer-based, self-guided training to teach step-by-step instructions for each session of Copy Cat program (CBT for anxiety), videos of treatment sessions, therapist tips, and links to research articles ^j	--	--	--	--	--	--	--	Wkly consultation via virtual conferencing platform for 3 mths after training (phone or via computer) to attend 1-hr wkly virtual gp mtgs
Beidas et al., 2012 ¹ Arm 3 Routine Training	--	6-hr workshop to teach session-by-session Copy Cat program (CBT for anxiety) that included didactic instruction (PowerPoint) and viewing of videotapes of representative youths receiving treatment ^j	--	--	--	--	--	--	Wkly consultation via virtual conferencing platform for 3 mths after training (phone or via computer) to attend 1-hr wkly virtual grp mtgs

Table B-1. SIMHC intervention EPOC taxonomy table, professional components (components)

Study, Yr Arm Strategy	Distribution of Educational Materials^a	Educational Meetings^b	Local Consensus Processes^c	Educational Outreach Visits^d	Patient- Mediated Interventions^e	Audit and Feedback^f	Reminders^g	Marketing^h	Otherⁱ
Bickman et al., 2011 ² Arm 1 Feedback	Web-based modules, but unsuccessful intervention component, considered an implementation failure	Initial workshop	--	--	Audit and feedback described below comes from patient, caregiver, and clinician scores of symptom severity and functioning	Wkly feedback plus cumulative 90-day feedback ^j	--	--	Individual support by phone or email
Bickman et al., 2011 ² Arm 2 Control	Web-based modules, but unsuccessful intervention component, considered an implementation failure	Initial workshop	--	--	Audit and feedback described below comes from patient, caregiver, and clinician scores of symptom severity and functioning	Cumulative 90-day feedback only ^j	--	--	Individual support by phone or email
Carroll et al., 2013 ³ Arm 1 Computer Decision Support Plus EHR Plus ADHD Guidelines	--	--	--	--	Data from scannable prescreener form containing 20 questions that parents answer while in waiting room are entered into CHICA system; 3 screening questions alerted CHICA to potential ADHD ^j	--	Six prompts to physician included checkbox responses to record physician's assessment and actions specific to ADHD. CHICA ADHD module automatically printed customized and	--	--

Table B-1. SIMHC intervention EPOC taxonomy table, professional components (components)

Study, Yr Arm Strategy	Distribution of Educational Materials ^a	Educational Meetings ^b	Local Consensus Processes ^c	Educational Outreach Visits ^d	Patient- Mediated Interventions ^e	Audit and Feedback ^f	Reminders ^g	Marketing ^h	Other ⁱ
Carroll et al., 2013 ³ Arm 1 Computer Decision Support Plus EHR Plus ADHD Guidelines (continued)						---	scannable assessment scales if child was suspected of having ADHD based on parent answers or was already diagnosed with ADHD. If follow-up assessment needed, CHICA automatically printed parent and teacher follow-up forms. CHICA ADHD module instructed physician in proper distribution and completion of forms to screening questions ^j	--	--
Carroll et al., -- 2013 ³ Arm 2 Computer Decision Support Plus EHR	--	--	--	--	Data from scannable prescreener form containing 20 questions parents answer while in the waiting room are entered into CHICA system ^j	--	Six prompts to physicians include check box responses to record physician's assessment and actions ^j	--	--

Table B-1. SIMHC intervention EPOC taxonomy table, professional components (components)

Study, Yr Arm Strategy	Distribution of Educational Materials ^a	Educational Meetings ^b	Local Consensus Processes ^c	Educational Outreach Visits ^d	Patient- Mediated Interventions ^e	Audit and Feedback ^f	Reminders ^g	Marketing ^h	Other ⁱ
Epstein et al., 2011 ⁴ Arm 1 Internet portal access to EBP	Two 60-min didactic sessions conducted by a practicing community- based, primary care physician ^j	Sessions conducted by a practicing community-based, primary care physician ^j	--	--	Internet-based platform through which parents, Teachers, and pediatricians all input information (e.g., rating scales) about target child during initial ADHD assessment and treatment. After rating scales are input by parents and teachers, computerized algorithms score and interpret data and output a report that is helpful to pediatricians ^j	Introduced to a performance improvement Technique that focuses on performing small tests of change or plan- do-study-act cycles ^j	Internet portal for all new and existing patients to assess ADHD, to titrate medications, monitor responses to medications systematically, communicate with parents and teachers through email, and monitor ADHD care quality by using an online report card ^j	--	--
Epstein et al., 2011 ⁴ Arm 2 Waitlist control	--	--	--	--	--	--	--	--	--

Table B-1. SIMHC intervention EPOC taxonomy table, professional components (components)

Study, Yr Arm Strategy	Distribution of Educational Materials^a	Educational Meetings^b	Local Consensus Processes^c	Educational Outreach Visits^d	Patient- Mediated Interventions^e	Audit and Feedback^f	Reminders^g	Marketing^h	Otherⁱ
Epstein et al., 2007 ⁵ Arm 1 Titration and Monitoring (collaborative consultation)	--	--	--	--	--	Collaborative care service where pediatricians were taught to use different wkly titration trials to determine optimal doses of ADHD medication for children with ADHD who had not been on medication previously, using data collected from both parents and teachers (rating scales to monitor medication efficacy and side effects during medication maintenance) with reports of rating sent back to pediatricians ^j	--	--	--

Table B-1. SIMHC intervention EPOC taxonomy table, professional components (components)

Study, Yr Arm Strategy	Distribution of Educational Materials ^a	Educational Meetings ^b	Local Consensus Processes ^c	Educational Outreach Visits ^d	Patient- Mediated Interventions ^e	Audit and Feedback ^f	Reminders ^g	Marketing ^h	Other ⁱ
Epstein et al., 2007 ⁵ Arm 2 Control	--	--	--	--	--	--	--	--	--
Garner et al., 2012 ^{6, p} Arm 1 Pay for Performance	Reading A-CRA treatment manual	3 1/2 day A-CRA training workshop	--	Quantitative and qualitative feedback from trained raters and participation in bi- wkly calls with developers of A- CRA model	--	--	--	--	Therapists also received quantitative and qualitative feedback from trained raters and participated in bi- wkly calls with developers of A- CRA model
Garner et al., 2012 ⁶ Arm 2 Implementa- tion as usual	Reading A-CRA treatment manual	3 1/2 day A-CRA training workshop	--	Quantitative and qualitative feedback from trained raters and participation in bi- wkly calls with developers of A- CRA model	--	--	--	--	Therapists also received quantitative and qualitative feedback from trained raters and participated in bi- wkly calls with developers of A- CRA model
Glisson et al., 2012 ⁷ Arm 1 ARC	ARC team- based manual to create organizational social contexts necessary for successful implementation ^j	ARC training ^j	--	ARC specialist who trains clinicians in using organizational tools that are required for clinicians to identify and address barriers to service innovation and effectiveness in their agency ^j	--	Intervention provides feedback tools ^j	--	--	Train to use tools to identify and address barriers to service innovation and effectiveness in their agency; Develop cognitive models and attitudes among clinicians and administrators necessary for service innovation and improvement efforts ^j

Table B-1. SIMHC intervention EPOC taxonomy table, professional components (components)

Study, Yr Arm Strategy	Distribution of Educational Materials ^a	Educational Meetings ^b	Local Consensus Processes ^c	Educational Outreach Visits ^d	Patient- Mediated Interventions ^e	Audit and Feedback ^f	Reminders ^g	Marketing ^h	Other ⁱ
Glisson et al., 2012 ⁷ Arm 2 Control	--	--	--	--	--	--	--	--	--
Glisson et al., 2010 ⁸ Arm 1 ARC and MST	ARC team- based manual to create organizational social contexts necessary for successful implementation and MST manual for therapist ^j	5-day MST orientation and booster training ^j	--	ARC specialist who trains clinicians in using organizational tools required for clinicians to identify and address barriers to service innovation and effectiveness in their agency and on-site MST clinical supervision guided by a manual-based supervision protocol ^j	--	Feedback on adherence to MST protocols ^j	--	--	Trained to use tools to identify and address barriers to service innovation and effectiveness in their agency; develop cognitive models and attitudes among clinicians and administrators necessary for service innovation and improvement efforts ^j
Glisson et al., 2010 ⁸ Arm 2 MST	MST manual for therapist ^j	5-day MST orientation and booster training ^j	--	On-site MST clinical supervision guided by a manual-based supervision protocol ^j	--	Feedback on adherence to MST protocols ^j	--	--	--

Table B-1. SIMHC intervention EPOC taxonomy table, professional components (components)

Study, Yr Arm Strategy	Distribution of Educational Materials ^a	Educational Meetings ^b	Local Consensus Processes ^c	Educational Outreach Visits ^d	Patient- Mediated Interventions ^e	Audit and Feedback ^f	Reminders ^g	Marketing ^h	Other ⁱ
Glisson et al., 2010 ⁸ Arm 3 ARC	ARC team-based manual to create organizational social contexts necessary for successful implementation ^j	ARC training ^j	--	ARC specialist who trains clinicians in using organizational tools required for clinicians to identify and address barriers to service innovation and effectiveness in their agency ^j	--	--	--	--	Train to use tools to identify and address barriers to service innovation and effectiveness in their agency; develop cognitive models and attitudes among clinicians and administrators necessary for service innovation and improvement efforts ^j
Glisson et al., 2010 ⁸ Arm 4 Control	--	--	--	--	--	--	--	--	--
Gully et al., 2008 ⁹ Study 1 Protocol	Booklet for parents describing protocol ^j	Nurses received training on forensic medical examinations); Nurses received training on protocol ^j	--	Nurses met with parents. Nurses trained by project manager and observed on occasion administering protocol so corrective feedback could be provided ^j	Use of parent responses to barriers and assets of accessing EBT on checklist ^j	--	--	--	--
Gully et al., 2008 ⁹ Study 1 Comparison - Prior to Implementa- tion	--	Nurses received training on forensic medical examinations	--	--	--	--	--	--	--

Table B-1. SIMHC intervention EPOC taxonomy table, professional components (components)

Study, Yr Arm Strategy	Distribution of Educational Materials^a	Educational Meetings^b	Local Consensus Processes^c	Educational Outreach Visits^d	Patient- Mediated Interventions^e	Audit and Feedback^f	Reminders^g	Marketing^h	Otherⁱ
Gully et al., 2008 ⁹ Study 2 Protocol	Booklet for parents describing protocol ^l	Nurses received training on forensic medical examinations; nurses received training on protocol ^l	--	Nurses met with parents; nurses trained by project manager and observed on occasion administering protocol so corrective feedback could be provided ^l	--	--	--	--	--
Gully et al., 2008 ⁹ Study 2 Typical Services	--	Nurses received training on forensic medical examinations	--	Use of parent responses to barriers and assets of accessing EBT on checklist ^l	--	--	--	--	--
Henggeler et al., 2013 ¹⁰ Arm 1 Workshop enhanced with ongoing access to CM implementa- tion resources (WSR)	Manual, handouts, worksheets, therapist scripts ^j	Workshop in contingency management (CM to treat adolescents with substance abuse disorders that included didactic instruction, trainer role-play, and therapist role- play)	--	--	--	--	--	--	Drug screen kits and supplies; continuing education credits

Table B-1. SIMHC intervention EPOC taxonomy table, professional components (components)

Study, Yr Arm Strategy	Distribution of Educational Materials^a	Educational Meetings^b	Local Consensus Processes^c	Educational Outreach Visits^d	Patient- Mediated Interventions^e	Audit and Feedback^f	Reminders^g	Marketing^h	Otherⁱ
Henggeler et al., 2013 ¹⁰ Arm 2 WSR plus computer assisted training for 6 mths following workshop (WSR+CAT)	Manual, handouts, worksheets, therapist scripts, plus video clips of difficult situations implementing CM and additional computer-accessible worksheets and homework to practice CM ^l	Workshop in contingency management (CM to treat adolescents with substance abuse disorders; included didactic instruction, trainer role-play, and therapist role-play)	--	--	--	--	--	--	Drug screen kits and supplies; continuing education credits
Henggeler et al., 2013 ¹⁰ Arm 3 WSR+CAT plus ongoing support from a CM expert for 12 mths following workshop (WSR+CAT+SS)	Manual, handouts, worksheets, therapist scripts, plus video clips of difficult situations implementing CM and additional computer-accessible worksheets and homework to practice CM ^l	Workshop in contingency management (CM to treat adolescents with substance abuse disorders; included didactic instruction, trainer role-play, and therapist role-play)	--	Site visits by CM experts to assess baseline supervisory practices, individualized booster training and bi-wkly telephone consultations between experts and supervisors to review barriers to CM implementation and tapes of supervision and therapist use of CM ^l	--	--	--	--	Drug screen kits and supplies; continuing education credits
Henggeler et al., 2008 ¹¹ Arm 1 Intensive Quality Assurance	Manuals	2-day workshop in contingency management (CM to treat adolescents with substance abuse disorders)	--	Access to a CM expert for consultation	--	--	--	--	Drug screen test kits and supplies

Table B-1. SIMHC intervention EPOC taxonomy table, professional components (components)

Study, Yr Arm Strategy	Distribution of Educational Materials^a	Educational Meetings^b	Local Consensus Processes^c	Educational Outreach Visits^d	Patient- Mediated Interventions^e	Audit and Feedback^f	Reminders^g	Marketing^h	Otherⁱ
Henggeler et al., 2008 ¹¹ Arm 2 Workshop Only	Manuals	2-day workshop in contingency management (CM to treat adolescents with substance abuse disorders)	--	Access to a CM expert for consultation	--	--	--	--	Drug screen test kits and supplies
Lester et al., 2009 ¹² Arm 1 GP Training in First-Episode Psychosis		Educational sessions ^j	Focus groups and training-needs analysis to tailor intervention ^j	Videos, question-and-answer sessions, education sessions ^j	--	--	--	Focus groups used to shape intervention	--
Lester et al., 2009 ¹² Arm 2 Control	--	--	--	--	--	--	--	--	--

Table B-1. SIMHC intervention EPOC taxonomy table, professional components (components)

Study, Yr Arm Strategy	Distribution of Educational Materials ^a	Educational Meetings ^b	Local Consensus Processes ^c	Educational Outreach Visits ^d	Patient- Mediated Interventions ^e	Audit and Feedback ^f	Reminders ^g	Marketing ^h	Other ⁱ
Lochman et al., 2009 ¹³ Arm 1 Coping Power– Training Plus Feedback	Video depicting role-played primary care consultations, question-and-answer session, referral guidelines to early-intervention services ^j	School counselors received a total of three initial workshop training days in fall, prior to beginning of intervention ^j	--	--	--	Trainers reviewed completion of session objectives and provided individualized supervisory feedback through written and telephone contacts. Counselors received monthly letter and phone call from trainer when serious concerns with implementation were evident. Trainers also provided qualitative feedback based on counselors' performance during sessions ^j	--	Problem solving concerning barriers and difficulties involved in implementation of program ^j	Monthly ongoing training sessions (2.0 hrs). Technical assistance component to address barriers and difficulties that included accessibility to trainers via email communication and a telephone hotline ^j
Lochman et al., 2009 ¹³ Arm 2 CP-BT	--	School counselors received a total of three initial workshop training days in fall, prior to beginning of intervention ^j	--	--	--	--	--	Problem solving concerning barriers and difficulties involved in implementation of program ^j	--

Table B-1. SIMHC intervention EPOC taxonomy table, professional components (components)

Study, Yr Arm Strategy	Distribution of Educational Materials ^a	Educational Meetings ^b	Local Consensus Processes ^c	Educational Outreach Visits ^d	Patient- Mediated Interventions ^e	Audit and Feedback ^f	Reminders ^g	Marketing ^h	Other ⁱ
Lochman et al., 2009 ¹³ Arm 3 Comparison Condition (unspecified)	--	--	--	--	--	--	--	--	--
Ronsley et al., 2012 ¹⁴ Arm 1 MMTP	Physician handbook for metabolic monitoring ^j	Training workshops for all staff. Before implementation of MMTP, physicians from British Columbia Children's Hospital travelled to Vancouver Coastal Health CYMHTs and explained risks of SGA use in children to staff ^j	-	Before MMTP physicians travelled to CYMHTs and explained risks of SGA use ^j	-	-	MMTP provides recommenda- tions for completing anthropometric measurements (including weight, height, waist circumference, and blood pressure) and monitoring various blood work parameters at several time points throughout first year of SGA treatment (including at baseline, and at 3, 6, 9, and 12 mths) ^j	-	MMT available online); project coordinator worked with each team individually to determine which staff would assume responsibility for completing measures ^j

Table B-1. SIMHC intervention EPOC taxonomy table, professional components (components)

Study, Yr Arm Strategy	Distribution of Educational Materials ^a	Educational Meetings ^b	Local Consensus Processes ^c	Educational Outreach Visits ^d	Patient- Mediated Interventions ^e	Audit and Feedback ^f	Reminders ^g	Marketing ^h	Other ⁱ
Ronsley et al., 2012 ¹⁴ Arm 2 Usual Care Pre-MMTP	-	-	-	-	-	-	-	-	-

^a Distribution of published or printed recommendations for clinical care, including clinical practice guidelines, audio-visual materials, and electronic publications. The materials may have been delivered personally or through mass mailings.

^b Health care providers who have participated in conferences, lectures, workshops, or traineeships.

^c Inclusion of participating providers in discussion to ensure that they agreed that the chosen clinical problem was important and the approach to managing the problem was appropriate.

^d Use of a trained person who met with providers in their practice settings to give information with the intent of changing the provider's practice. The information given may have included feedback on the performance of the provider(s).

^e New clinical information (not previously available) collected directly from patients and given to the provider (e.g., depression scores from an instrument).

^f Any summary of clinical performance of health care over a specified period of time. The summary may also have included recommendations for clinical action. The information may have been obtained from medical records, computerized databases, or observations from patients.

^g Patient- or encounter-specific information, provided verbally, on paper, or on a computer screen, that is designed or intended to prompt a health professional to recall information. This would usually be encountered through their general education, in the medical records, or through interactions with peers and would remind them to perform or avoid some action to aid individual patient care. Computer-aided decision support and drugs dosage are included.

^h Use of personal interviewing, group discussion (focus groups), or a survey of targeted providers to identify barriers to change and subsequent design of an intervention that addresses identified barriers.

ⁱ Other categories to be agreed on in consultation with the EPOC editorial team.

^j Component differed across study arms.

A-CRA = Adolescent Community Reinforcement Approach; ADHD = attention deficit hyperactivity disorder; ARC = Availability, Responsiveness and Continuity Availability, Responsiveness and Continuity; BHCP = Behavioral Healthcare Provider; bi-wkly = bi-weekly; CBT = cognitive behavioral therapy; CHICA = Child Health Improvement through Computer Automation; CM = contingency management; CP-TF = CP training plus feedback; CRA = community reinforcement approach; CYMHT = Child and Youth Mental Health Teams; EBP = Evidence-based practice; EBT = electronic benefit transfer; EHR = electronic health record; EPOC = Effective Practice and Organisation of Care; GP = general practitioner; gp = group; hr = hour; MMT = Metabolic Monitoring Training; MMTP = Metabolic Monitoring Training Program; MST = Multisystemic Therapy; mtgs = meetings; mths = months; SBIRT = Screening, Brief Intervention, and Referral to Treatment; SGA = second-generation antipsychotics; SIMHC = Strategies To Improve Mental Health Care for Children and Adolescents; wkly = weekly; WSR = workshop and resources; WSR+CAT = workshop and resources plus computer assisted training; WSR+CAT+SS = workshop and resources plus computer assisted training plus biweekly telephone consultations between CM experts and supervisors for 12 months following the workshop; Yr = year.

Table B--2. SIMHC intervention EPOC taxonomy table, financial components (provider and patient)

Study, Yr Arm Strategy	Provider: Incentives^a	Provider: Grant/Allowance^b	Provider: Other^c	Patient: Incentives^d
Epstein et al., 2011 ⁴ Arm 1 Internet portal access to EBP	Credit toward American Board of Pediatrics Maintenance of Certification Performance in Practice requirement ^e	--	--	--
Epstein et al., 2011 ⁴ Arm 2 Waitlist control	--	--	--	--
Garner et al., 2012 ⁶ Arm 1 Pay for Performance	\$200 for each patient who received at least 10 of 12 specific A-CRA procedures delivered in first 14 days of treatment in no fewer than 7 sessions plus \$50 for each month they demonstrated competent delivery of all components of at least 1 A-CRA treatment procedure during same treatment session ^e	\$300,000 for each of 3 years to support A-CRA implementation from SAMHSA	--	--
Garner et al., 2012 ⁶ Arm 2 Implementation as usual	--	\$300,000 for each of 3 years to support A-CRA implementation from SAMHSA	--	--
Henggeler et al., 2013 ¹⁰ Arm 1 Workshop enhanced with ongoing access to CM implementation resources (WSR)	--	--	--	\$100 vouchers were given to providers to give out to up to 6 substance abusing youth
Henggeler et al., 2013 ¹⁰ Arm 2 WSR plus computer assisted training for 6 mths following workshop (WSR+CAT)	--	--	--	\$100 vouchers were given to providers to give out to up to 6 substance abusing youth
Henggeler et al., 2013 ¹⁰ Arm 3 WSR+CAT plus ongoing support from a CM expert for 12 mths following workshop (WSR+CAT+SS)	--	--	--	\$100 vouchers were given to providers to give out to up to 6 substance abusing youth

Table B-2. SIMHC intervention EPOC taxonomy table, financial components (provider and patient) (continued)

Study, Yr Arm Strategy	Provider: Incentives ^a	Provider: Grant/Allowance ^b	Provider: Other ^c	Patient: Incentives ^d
Henggeler et al., 2008 ¹¹ Arm 1 Intensive Quality Assurance	--	--	\$150 to facilitate treatment goals via CM voucher system	Voucher system that rewarded patients for clean substance screens ^a
Henggeler et al., 2008 ¹¹ Arm 2 Workshop Only	--	--	\$150 to facilitate treatment goals via CM voucher system	--

^a Provider received direct or indirect financial reward or benefit for doing specific action.

^b Provider received direct or indirect financial reward or benefit not tied to specific action.

^c Other categories to be agreed on in consultation with the EPOC editorial team.

^d Patient received direct or indirect financial reward or benefit for doing or encouraging them to do specific action.

^e Component differed across study arms.

A-CRA = Adolescent Community Reinforcement Approach; BHCP = Behavioral Healthcare Provider; CM = contingency management; CP-BT = Coping Power—Basic Training; EPOC = Effective Practice and Organisation of Care; MMTP = Metabolic Monitoring Training Program; SAMHSA = Substance Abuse Mental Health Services Administration; SBIRT = Screening, Brief Intervention, and Referral to Treatment; SIMHC = Strategies To Improve Mental Health Care for Children and Adolescents; WSR = workshop and resources; WSR+CAT = workshop and resources plus computer assisted training; WSR+CAT+SS = workshop and resources plus computer assisted training plus biweekly telephone consultations between CM experts and supervisors for 12 months following the workshop.

Table B--3. SIMHC intervention EPOC taxonomy table, provider-oriented organizational components

Study, Yr Arm Strategy	Clinical Multidisciplinary Teams^a	Satisfaction of Providers With the Conditions of Work and the Material and Psychic Rewards^b
Epstein et al., 2011 ⁴ Arm 1 Internet portal access to EBP	Collaborative consultation services to assist with titration and monitoring of ADHD medications: pediatricians were assisted in using titration trials to determine optimal dosages for children and using rating scales to monitor medication efficacy and side effects during medication maintenance ^c	
Epstein et al., 2011 ⁴ Arm 2 Wait list control	--	--
Glisson et al., 2012 ⁷ Arm 1 ARC	--	Work by ARC specialist to bridge social and technical gaps between those seeking to implement service improvements and other key stakeholders (e.g., clinical teams and administrators, respectively) ^c
Glisson et al., 2012 ⁷ Arm 2 Control	--	--
Glisson et al., 2010 ⁸ Arm 1 MST+ARC	--	Work by ARC specialist to bridge social and technical gaps between those seeking to implement service improvements and other key stakeholders (e.g., clinical teams and administrators, respectively) ^c
Glisson et al., 2010 ⁸ Arm 2 MST	--	Work by ARC specialist to bridge social and technical gaps between those seeking to implement service improvements and other key stakeholders (e.g., clinical teams and administrators, respectively) ^c
Glisson et al., 2010 ⁸ Arm 3 ARC	--	--
Glisson et al., 2010 ⁸ Arm 4 Control	--	--
Sterling et al., 2015 ¹⁵ Arm 1 Pediatrician Implementation of SBIRT	-	-

Table B-3. SIMHC intervention EPOC taxonomy table, provider-oriented organizational components (continued)

Study, Yr Arm Strategy	Clinical Multidisciplinary Teams^a	Satisfaction of Providers With the Conditions of Work and the Material and Psychic Rewards^b
Sterling et al., 2015 ¹⁵ Arm 2 BHCP Implementation of SBIRT	BHCPs to implement SBIRT ^c	-

^a Creation of a new team of health professionals of different disciplines or additions of new members to the team who work together to care for patients.

^b Interventions to “boost morale.”

^c Component differed across study arms.

ADHD = attention deficit hyperactivity disorder; ARC = Availability, Responsiveness and Continuity Availability, Responsiveness and Continuity; BHCP = Behavioral Healthcare Provider; CM = contingency management; CP-BT = Coping Power—Basic Training; EPOC = Effective Practice and Organisation of Care; GP = general practitioner; MMTP = Metabolic Monitoring Training Program; mths = months; SBIRT = screening, Brief Intervention, and Referral to Treatment; SIMHC = Strategies To Improve Mental Health Care for Children and Adolescents; WSR = workshop and resources; WSR+CAT = workshop and resources plus computer assisted training; WSR+CAT+SS = workshop and resources plus computer assisted training plus biweekly telephone consultations between CM experts and supervisors for 12 months following the workshop.

Table B--4. SIMHC intervention EPOC taxonomy table, organizational components: structural interventions

Study, Yr Arm Strategy	Changes in Scope and Nature of Benefits and Services	Presence and Organization of Quality Monitoring Mechanisms	Staff Organization	Other^a
Bickman et al., 2011 ^{2,1} Arm 1 Feedback	-	Ongoing monitoring	-	-
Bickman et al., 2011 ^{2,1} Arm 2 Control	-	Ongoing monitoring	-	-
Carroll et al., 2013 ³ Arm 1 Computer Decision Support Plus EHR Plus ADHD Guidelines		Prompts to record assessments and actions, specific to ADHD, so parent and teacher assessment forms were automatically stored by CHICA and recorded in system. CHICA printed a summary sheet with all subscores and interpretations from each assessment form. Interpretations were also made available as prompts on physician worksheet at subsequent follow-up visits. CHICA ADHD module also made treatment recommendations based on established guidelines. This included appropriate starting doses for medications and suggested medication changes if treatment goals were not met ^b	-	-
Carroll et al., 2013 ³ Arm 2 Computer Decision Support Plus EHR		Prompts to record assessments and actions but not specific to ADHD ^a	-	-
Epstein et al., 2011 ⁴ Arm 1 Internet portal access to EBP		3, 6, 9, and 12 mths after training, study staff members contacted offices to prompt them to review their Internet portal practice report cards. After identifying underperforming practice behaviors, each practice identified an area to target and then created a plan-do-study-act cycle ¹³ to address target behavior ^b	Goal of modifying office flow ^a	-
Epstein et al., 2011 ⁴ Arm 2 Waitlist control	-	-	-	-

Table B-4. SIMHC intervention EPOC taxonomy table, organizational components: structural interventions (continued)

Study, Yr Arm Strategy	Changes in Scope and Nature of Benefits and Services	Presence and Organization of Quality Monitoring Mechanisms	Staff Organization	Other^a
Glisson et al., 2010 ⁸ Arm 1 MST+ARC	--	MST quality assurance system ^b	--	--
Glisson et al., 2010 ⁸ Arm 2 MST	--	MST quality assurance system ^b	--	--
Glisson et al., 2010 ⁸ Arm 3 ARC	--	--	--	--
Glisson et al., 2010 ⁸ Arm 4 Control	--	--	--	--
Henggeler et al., 2013 ¹⁰ Arm 1 Workshop enhanced with ongoing access to CM implementation resources (WSR)	--	Intensive Quality Assurance program based on intensive QA protocols used in MST programs ^b	--	--
Henggeler et al., 2013 ¹⁰ Arm 2 WSR plus computer assisted training for 6 mths following workshop (WSR+CAT)	--	--	--	--
Henggeler et al., 2013 ¹⁰ Arm 3 WSR+CAT plus ongoing support from a CM expert for 12 mths following workshop (WSR+CAT+SS)	--	--	--	--
Wildman et al., 2012 ¹⁶ Arm 1 Colocated Services	Intervention removed two of frequently cited barriers to treatment: availability and cost. All referred families were seen within 1 week of referral and services were provided without cost to family	-	-	Enhanced referrals, received number to call; choice of where they wanted to attend section ^b

Table B-4. SIMHC intervention EPOC taxonomy table, organizational components: structural interventions (continued)

Study, Yr Arm Strategy	Changes in Scope and Nature of Benefits and Services	Presence and Organization of Quality Monitoring Mechanisms	Staff Organization	Other^a
Wildman et al., 2012 ¹⁶ Arm 2 Enhanced Referral	Intervention removed two of frequently cited barriers to treatment: availability and cost. All referred families were seen within 1 week of referral and services were provided without cost to family	-	-	-

^a Other categories to be agreed on in consultation with the EPOC editorial team

^b Component differed across study arms

ADHD = attention deficit hyperactivity disorder; BHCP = Behavioral Healthcare Provider; CHICA = Child Health Improvement through Computer Automation; CP-BT = Coping Power—Basic Training; EPOC = Effective Practice and Organisation of Care; MMTP = Metabolic Monitoring Training Program; MST = Multisystemic therapy; mths = months; QA = quality assurance; SBIRT = Screening, Brief Intervention, and Referral to Treatment; SIMHC = Strategies To Improve Mental Health Care for Children and Adolescents; WSR = workshop and resources; WSR+CAT = workshop and resources plus computer assisted training; WSR+CAT+SS = workshop and resources plus computer assisted training plus biweekly telephone consultations between CM experts and supervisors for 12 months following the workshop;.

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Appendix C. Excluded Studies

- X 1 Wrong publication type (Editorials, Letters, Opinions, or Commentaries to the editor with no primary data, Nonsystematic Review articles)
- X 2 Wrong population (Population does not include health care systems, organizations, and providers; population does not provide care for children and adolescents with mental health problems and substance abuse disorders)
- X 3 Wrong or no comparator (Not usual care or other D/I/QI strategies)
- X 4 Wrong or no outcome (See Include/Exclude criteria for exceptions)
- X 5 Wrong setting (Settings not comparable with outpatient settings; In-patients or those in residential treatment or drug treatment program; incarcerated populations)
- X 6 Wrong geographical setting (Countries with human development index of low to high)
- X 7 Wrong Study Design (Case reports, case series)
- X 8 Wrong or no intervention (Non-D/I/QI strategies; interventions that do not target health care systems or providers to improve the quality of care for children and adolescents with mental health problems)
- X 9 Study size <50 subjects
- X 10 Wrong language

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| <p>1. Moderators and mediators of treatment response for children with attention-deficit/hyperactivity disorder: the Multimodal Treatment Study of children with Attention-deficit/hyperactivity disorder. Arch Gen Psychiatry. 1999 Dec;56(12):1088-96. PMID: 10591284. Exclusion Code: X 2</p> <p>2. A 14-month randomized clinical trial of treatment strategies for attention-deficit/hyperactivity disorder. The MTA Cooperative Group. Multimodal Treatment Study of Children with ADHD. Arch Gen Psychiatry. 1999 Dec;56(12):1073-86. PMID: 10591283. Exclusion Code: X 2</p> <p>3. Initial impact of the Fast Track prevention trial for conduct problems: II. Classroom effects. Conduct Problems Prevention Research Group. J Consult Clin Psychol. 1999 Oct;67(5):648-57. PMID: 10535231. Exclusion Code: X 8</p> <p>4. Therapeutic community effectiveness: a systematic international review of therapeutic community treatment for people with personality disorders and mentally disordered offenders (Structured abstract). Database of Abstracts of Reviews of Effects: University of York; 1999. p. 214. Exclusion Code: X 8</p> | <p>5. Fluvoxamine for the treatment of anxiety disorders in children and adolescents. The Research Unit on Pediatric Psychopharmacology Anxiety Study Group. N Engl J Med; 2001. p. 1279-85. Exclusion Code: X 2</p> <p>6. Parent-training/education programmes in the management of children with conduct disorders (Structured abstract). Health Technology Assessment Database: National Institute for Health and Clinical Excellence (NICE); 2006. p. 49. Exclusion Code: X 2</p> <p>7. Implementing CBT for traumatized children and adolescents after september 11: lessons learned from the Child and Adolescent Trauma Treatments and Services (CATS) Project. J Clin Child Adolesc Psychol. 2007 Oct-Dec;36(4):581-92. PMID: 18088216. Exclusion Code: X 4</p> <p>8. Implementation of CBT for youth affected by the World Trade Center disaster: matching need to treatment intensity and reducing trauma symptoms. J Trauma Stress; 2010. p. 699-707. Exclusion Code: X 4</p> <p>9. [Therapy of moderately severe depressions in daily practice: first patient care research study reinforces clinical data]. MMW Fortschr Med. 2011 Oct 13;153(41):38-9. PMID: 22046838. Exclusion Code: X 10</p> |
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465. Stiles-Shields C, Hoste RR, Doyle PM, et al. A review of family-based treatment for adolescents with eating disorders. *Rev Recent Clin Trials.* 2012 May;7(2):133-40. PMID: 22353196. Exclusion Code: X 2
466. Sundell K, Hansson K, Lofholm CA, et al. The transportability of multisystemic therapy to Sweden: short-term results from a randomized trial of conduct-disordered youths. *J Fam Psychol.* 2008 Aug;22(4):550-60. PMID: 18729669. Exclusion Code: X 7
467. Sundell K, Hansson K, Löfholm CA, et al. The transportability of multisystemic therapy to Sweden: short-term results from a randomized trial of conduct-disordered youths. *J Fam Psychol.* 2008. p. 550-60. Exclusion Code: X 2
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497. Williford AP, Shelton TL. Using mental health consultation to decrease disruptive behaviors in preschoolers: adapting an empirically-supported intervention. *J Child Psychol Psychiatry*. 2008 Feb;49(2):191-200. PMID: 18211278. Exclusion Code: X 8
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Appendix D. Risk of Bias Assessment of Included Studies

Table D-1. Risk of bias assessment for strategies to improve mental health care for children and adolescents

First Author, Year	Were eligibility criteria described clearly?	Are the inclusion/exclusion criteria measured using valid and reliable measures, implemented across all study participants?	Was symptom status of subjects determined using valid and reliable methods?	Was the intervention or exposure clearly defined, across all study participant	Was randomization adequate?	Was allocation concealment adequate?	Did strategy for recruiting participants into the study the same across study groups?
Beidas et al., 2012 ¹	Yes	Yes	NA	Yes	Yes (randomization by date)	Yes	NA
Bickman et al., 2011 ²	Yes	Yes for sites; No for providers/patients	NA	Yes	Unclear	Unclear	NA
Carroll et al., 2013 ³	No for clinics; Yes for patients	Yes for sites; No for clinicians or patients	NA	Yes	No for clinics; Yes for patient chart selection within clinics	Unclear	NA
Epstein et al., 2007 ⁴	Yes	Yes	NA	Yes	Unclear	Unclear	NA
Epstein et al., 2011 ⁵	Yes	Yes	NA	Yes	Yes	Yes	NA
Garner et al., 2012 ⁶	Yes	Yes	NA	Yes	Yes	Yes	NA
Glisson et al., 2012 ⁷	Yes	Yes	NA	Yes	Yes	Unclear	NA
Glisson et al., 2013 ⁸							
Glisson et al., 2010 ⁹	Yes	Yes for sites; no for clinicians or patients	NA	NA	Unclear for counties, yes for patients	Unclear for counties, yes for patients	NA
Gully et al., 2008 ¹⁰ (study 1)	Yes	Yes	NA	Yes	NA	NA	NA
Gully et al., 2008 ¹⁰ (study 2)	Yes	Yes	NA	Yes	Unclear	Unclear	NA

Table D-1. Risk of Bias Assessment for strategies to improve mental health care for children and adolescents (continued)

First Author, Year	Were eligibility criteria described clearly?	Are the inclusion/exclusion criteria measured using valid and reliable measures, implemented across all study participants?	Was symptom status of subjects determined using valid and reliable methods?	Was the intervention or exposure clearly defined, across all study participant	Was randomization adequate?	Was allocation concealment adequate?	Did strategy for recruiting participants into the study the same across study groups?
Henggeler et al., 2008 ¹¹	No	Unclear	NA	Yes	NA	NA	NA
Henggeler et al., 2013 ¹²	No	NA	NA	Yes	Unclear	Unclear	NA
Lester et al., 2009 ¹³	Yes	Yes	NA	Yes	Yes	Yes	NA
Lochman et al., 2009 ¹⁴	Yes	Yes	NA	Yes	Unclear	Unclear	NA
Ronsley et al., 2012 ¹⁵	Yes	Yes	NA	Yes	NA	NA	Yes
Wildman et al., 2012 ¹⁶	No for the clinics, no patients	No for the clinics, no patients	NA	Yes	NA (unclear that all clinics were randomized)	NA	NA

NA = not applicable.

Table D--2. Risk of bias assessment for strategies to improve mental health care for children and adolescents

First Author, Year	Do start of follow-up and start of intervention coincide?	Are baseline characteristics similar between groups?	Did the study control for baseline differences between groups?	Were participants and the administrators of the intervention blinded to the intervention or exposure status of participants?	Were the outcome assessors blinded?
Beidas et al., 2012 ¹	NA	Unclear	NA	Not possible for participants	Yes
Bickman et al., 2011 ²	NA	NR by site, similar for patients, caregivers and clinicians	No	Not possible for clinicians; unclear for patients	Unclear
Carroll et al., 2013 ³	NA	Unclear for clinics, control arm has a higher proportion of black and Medicaid patients	No	Not possible for clinicians; unclear for patients	Unclear
Epstein et al., 2007 ⁴	NA	Yes	NA	No	Yes
Epstein et al., 2011 ⁵	NA	Unclear	No	Not possible for clinicians; unclear for patients	Unclear
Garner et al., 2012 ⁶	NA	Yes	NA	Not possible for clinicians,; unclear for patients	Unclear
Glisson et al., 2012 ⁷	NA	Unclear	Yes	Not possible for clinicians; unclear for patients	Yes
Glisson et al., 2013 ⁸	NA	Yes for counties, unclear for patients	No	Not possible for clinicians, unclear for patients	Unclear
Gully et al., 2008 ¹⁰ (study 1)	Yes	Yes	NA	No	No
Gully et al., 2008 ¹⁰ (study 2)	NA	No	Yes	No	No
Henggeler et al., 2008 ¹¹	Yes	No, WSO therapists older than IQA	No	Not possible for clinicians, unclear for patients	Unclear
Henggeler et al., 2013 ¹²	NA	No	No	Unclear	Unclear
Lester et al., 2009 ¹³	NA	No	No	Yes for patients	Yes
Lochman et al., 2009 ¹⁴	Yes	Unclear	No	Not possible for counselors, unclear for patients	Unclear
Ronsley et al., 2012 ¹⁵	No	Yes	No	NA	Unclear
Wildman et al., 2012 ¹⁶	Unclear	No, colocation parents likely to be older. Colocation parents less likely to be employed.	No	No	Unclear

NA = not applicable.

Table D--3. Risk of bias assessment for strategies to improve mental health care for children and adolescents

First author, Year	Were outcome assessors blinded to the exposure?	Was intervention fidelity adequate?	Was there a risk of recall bias?	Did the study focus on the time period that we are interested in?	Did researchers rule out any impact from a concurrent intervention or an unintended exposure that might bias results?
Beidas et al., 2012 ¹	NA	Yes	No	Yes	No
Bickman et al., 2011 ²	NA	Unclear	No	Yes	Unclear
Carroll et al., 2013 ³	NA	Unclear	No	Yes	Unclear
Epstein et al., 2007 ⁴	NA	No	No	Yes	Unclear
Epstein et al., 2011 ⁵	NA	NA (adherence varies, fidelity NA because intervention portal available)	No	Yes	Unclear
Garner et al., 2012 ⁶	NA	Yes	No	Yes	Unclear
Glisson et al., 2012 ⁷	NA	Yes	No	Yes	Unclear
Glisson et al., 2013 ⁸					
Glisson et al., 2010 ⁹	NA	Unclear, but similar across arms when measured (some tapes were missing)	No, except for out-of-home placement (based on caregiver recall)	Yes	Unclear
Gully et al., 2008 ¹⁰ (study 1)	NA	Unclear	No	Yes	No
Gully et al., 2008 ¹⁰ (study 2)	NA	Unclear	No	Yes	No
Henggeler et al., 2008 ¹¹	NA	Unclear	No	Yes	Unclear
Henggeler et al., 2013 ¹²	No	Unclear	Yes	Yes	No
Lester et al., 2009 ¹³	NA	Unclear	No	Yes	No (recruitment was in 3 waves as practices opened in the city)
Lochman et al., 2009 ¹⁴	NA	Unclear	No	Yes	Unclear
Ronsley et al., 2012 ¹⁵	NA	Unclear	No	Yes	Unclear
Wildman et al., 2012 ¹⁶	NA	Unclear	No	Yes	Unclear

NA = not applicable.

Table D--4. Risk of bias assessment for strategies to improve mental health care for children and adolescents

First Author, Year	Did variation from the study protocol compromise the conclusions of the study?	What was the overall attrition?/What was the overall response rate?	What was the overall differential attrition?	Did the study have high attrition or low response rate raising concern for bias?	Is the analysis conducted on an intention-to-treat (ITT) basis?
Beidas et al., 2012 ¹	Unclear	2% attrition at posttraining; 3% at follow-up assessment	Unclear but <5%	No	Yes (some outcomes)
Bickman et al., 2011 ²	Unclear	43% of sites	G1: (45.8%) 11/24 sites G2: (38.4%) 10/26 sites Differential attrition: 7.4%	Yes	No
Carroll et al., 2013 ³	Unclear	0 clinics dropped out, patient dropout rate NA because of retrospective selection of charts	NA	NA	NA
Epstein et al., 2007 ⁴	Unclear	100% had at least some missing data	Clinics: 0; Providers: G1: 64 % (16/25) G2: 81.5% (22/27); Differential attrition: 17.5; Patients differential attrition: 0 because of 100 partial or full attrition in both arms (Of 146 participants selected for follow-up, 45 had data from all 3 data points. The remaining 101 participants had at least 1 missing data point.)	Yes	Yes
Epstein et al., 2011 ⁵	No	NA (retrospective electronic; chart review)	NA	NA	NA
Garner et al., 2012 ⁶	No	organizations 0%, therapist competence ratings 19%, patient targets 20%, patient remission status 49%	1.7% for therapists, 0.4% for patient targets, 7.5% for patient remission	Yes	Yes
Glisson et al., 2012 ⁷ Glisson et al., 2013 ⁸	Unclear	2 control sites found ineligible after randomization and replaced. All 26 programs retained, loss to followup in clinicians Unclear	Unclear	Unclear	No

Table D-4. Risk of Bias Assessment for strategies to improve mental health care for children and adolescents (continued)

First Author, Year	Did variation from the study protocol compromise the conclusions of the study?	What was the overall attrition?/What was the overall response rate?	What was the overall differential attrition?	Did the study have high attrition or low response rate raising concern for bias?	Is the analysis conducted on an intention-to-treat (ITT) basis?
Glisson et al., 2010 ⁹	No	23.3% at 6 month f/u; 38.1% for 12 month f/u	4% at 6 month f/u; 6.7% at 12-month	Yes	No
Gully et al., 2008 ¹⁰ (study 1)	Unclear	48%	0%	Yes	NA
Gully et al., 2008 ¹⁰ (study 2)	Unclear	41% attrition	3%	Yes	No
Henggeler et al., 2008 ¹¹	Unclear	Unclear, 100% of therapists consented, but turnover (unspecified volume) of therapists occurred, and not all therapists referred patients to the study	Unclear	Unclear	No
Henggeler et al., 2013 ¹²	Unclear	100% completed baseline and postworkshop assessments. 96% of all CM use and implementation assessments were completed by telephone interview and 87% of CM knowledge assessments completed via paper/pencil forms returned via fax. Total of 22% attrition.	NR	No	Yes
Lester et al., 2009 ¹³	Unclear	Appears to be 0 for primary outcome, secondary outcome: 111/179	Unclear	Yes	No
Lochman et al., 2009 ¹⁴	Unclear	6% parents and 12% teacher ratings attrition	NR but not significant for some measures as reported in Methods	Some tests of differential attrition were significant	No
Ronsley et al., 2012 ¹⁵	NA	NA (retrospective electronic and chart review)	NA	NA	NA
Wildman et al., 2012 ¹⁶	Unclear	Unclear	Unclear	Unclear	NA

NA = not applicable.

Table D--5. Risk of bias assessment for strategies to improve mental health care for children and adolescents

First Author, Year	Did the analysis adjust for potential confounders?	Did the study have cross-overs or contamination raising concern for bias?	Were outcomes pre-specified/defined and adequately described?	Were outcome measures valid and reliable?	Were all important outcomes considered?
Beidas et al., 2012 ¹	NA	Unclear	Yes	Yes	Yes
Bickman et al., 2011 ²	NA	Unclear	Yes	Yes	No
Carroll et al., 2013 ³	NA	Unclear	Yes	Yes	Yes
Epstein et al., 2007 ⁴	NA	Unclear	Yes	Yes	Yes
Epstein et al., 2011 ⁵	NA	Unclear	Yes	Yes	Yes
Garner et al., 2012 ⁶	NA	Unclear	Yes	Yes	Yes
Glisson et al., 2012 ⁷	NA	NR	Yes	Yes	Yes
Glisson et al., 2013 ⁸					
Glisson et al., 2010 ⁹	NA	Unclear	Yes	Yes	Yes
Gully et al., 2008 ¹⁰ (study 1)	NA	Unclear	Yes	Unclear	Unclear
Gully et al., 2008 ¹⁰ (study 2)	NA	Unclear	Yes	Unclear	Unclear
Henggeler et al., 2008 ¹¹	NA	Unclear	Yes	Yes	Yes
Henggeler et al., 2013 ¹²	NA	Unclear	Yes	Yes	Yes
Lester et al., 2009 ¹³	NA	Unclear	Yes	Yes	Yes
Lochman et al., 2009 ¹⁴	NA	Unclear	Yes	Yes	Yes
Ronsley et al., 2012 ¹⁵	No	Unclear	Yes	Yes	Yes
Wildman et al., 2012 ¹⁶	NA	Unclear	Yes	No	Yes

NA = not applicable.

Table D--6. Risk of bias assessment for strategies to improve mental health care for children and adolescents

First Author, Year	Was the duration of followup adequate to assess the outcome?	Was an appropriate method used to handle missing data?	Risk of Bias Rating	Comments
Beidas et al., 2012 ¹	Yes	NA	Low	
Bickman et al., 2011 ²	Unclear	NA	High	Initial design was a 2X2, but over 40% of the sites dropped out, leaving only a standard vs. control experiment. Access to data from missing sites was not available for an ITT analysis. Blinding of patients and outcome assessors unclear. Method of randomization, allocation concealment, fidelity to protocol, timing of outcome measurement also unclear
Carroll et al., 2013 ³	Yes	NA	Unclear	Although study does not control for baseline differences in race and insurance status, these differences may not be relevant for main outcome
Epstein et al., 2007 ⁴	Yes	NA	High	High attrition rate (although ITT was conducted) and low fidelity/adherence
Epstein et al., 2011 ⁵	Yes	NA	Unclear	generally low of bias, but insufficient information on some criteria
Garner et al., 2012 ⁶	Yes	NA	Medium	Study has high attrition rates (authors report no difference in baseline characteristics between intervention and control arms)
Glisson et al., 2012 ⁷ Glisson et al., 2013 ⁸	Yes	NA	Unclear	Because 2 of 26 sites were found ineligible, they were replaced, but differences in baseline characteristics and controls for these potential differences were not described, so not possible to judge the effect of this alteration to the outcomes
Glisson et al., 2010 ⁹	Yes	NA	Medium	Rate of attrition is over 20%; missing information on fidelity; recall bias for out-of-home placement; unclear outcome assessor blinding
Gully et al., 2008 ¹⁰ (study 1)	Yes	No	High	High attrition and no adjustment for missing data, potential for confounding through nonrandom assignment
Gully et al., 2008 ¹⁰ (study 2)	Yes	NA	High	High attrition and no adjustment for missing data
Henggeler et al., 2008 ¹¹	Yes	NA	Unclear	Insufficient information to judge risk of bias on most criteria. Potential for bias from unmeasured concurrent interventions and turnover in therapists
Henggeler et al., 2013 ¹²	Yes	NA	Unclear	No information on randomization, allocation concealment, poor adherence in G3 arm
Lester et al., 2009 ¹³	Yes	NA	High	High attrition rate for secondary outcomes
Lochman et al., 2009 ¹⁴	Yes	NA	Unclear	Study has high attrition rates (authors report no difference in baseline characteristics between intervention and control arms)
Ronsley et al., 2012 ¹⁵	Yes	Unclear	Unclear	
Wildman et al., 2012 ¹⁶	Yes	Unclear	High	Study results not adjusted for baseline differences and did not measure “differences in the cultures served by the practice, how the PCPs explained the program, and other patient, physician, and practice attributes.”

ITT = intent to treat; NA = not applicable.

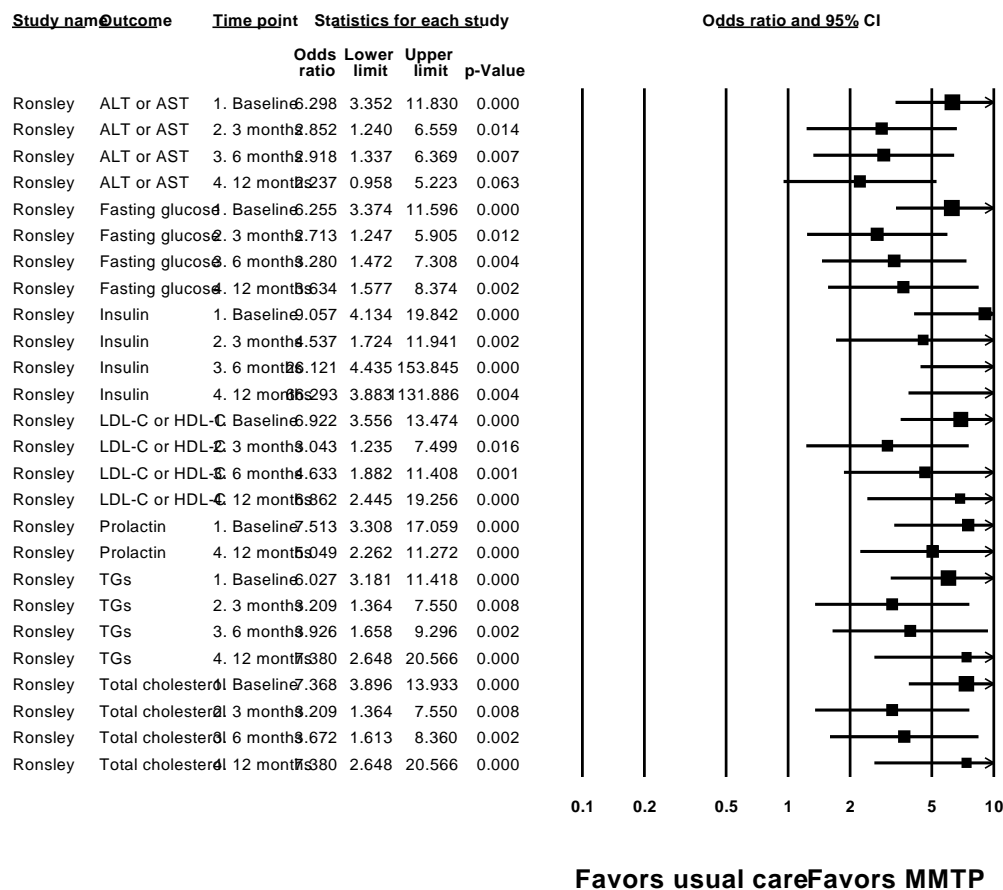
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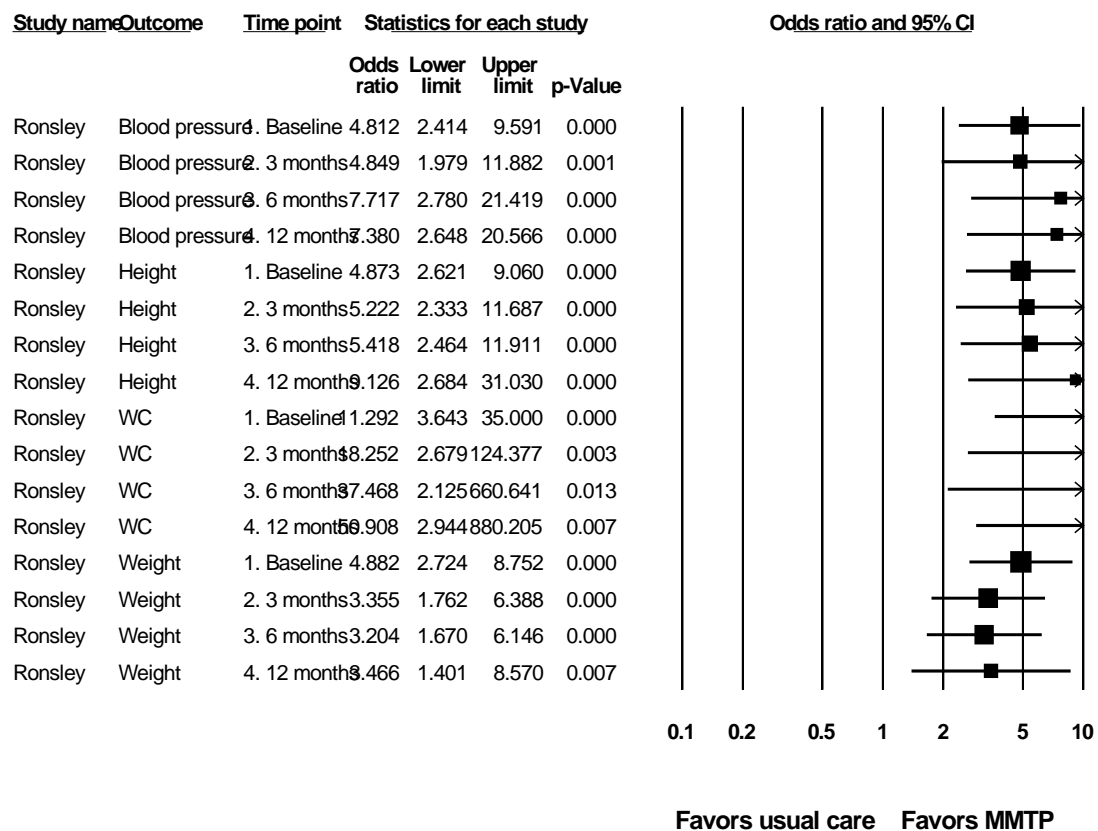
Appendix E. Forest Plots

Figure E-1. Blood work measures (Ronsley et al., 2012)



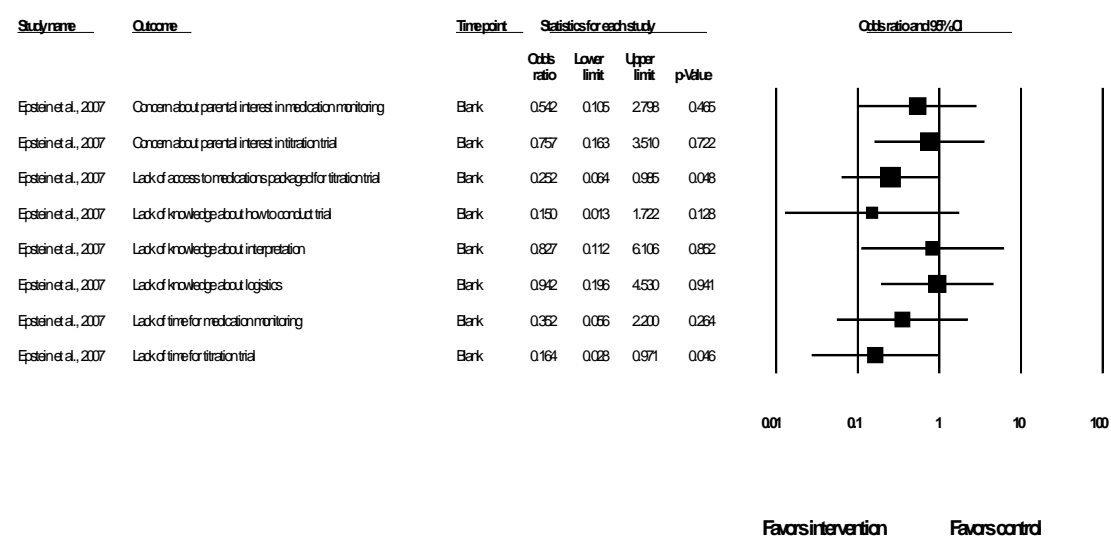
ALT = Aspartate aminotransferase; AST = Alanine aminotransferase; CI = confidence interval; LDL-C = Low density lipoprotein – cholesterol; HDL-C = High density lipoprotein – cholesterol; MMTP = Metabolic Monitoring Training Program; TGs =Triglycerides

Figure E-2. Anthropometric outcomes (Ronsley et al., 2012)



CI = confidence interval; MMTP = Metabolic Monitoring Training Program; WC = weight control.

Figure E-3. Obstacles preventing implementation (Epstein et al., 2007)



CI = confidence interval

Appendix F. Strength of Evidence Tables

Table F-1. Augmented active learning versus computerized routine versus routine professional training workshop to implement an EBP: Detailed strength of evidence

Outcome	Number of Studies; Subjects	Study Limitations	Consistency	Directness	Precision	Reporting Bias	Strength of Evidence Grade Magnitude of Effect
Intermediate outcome: Practitioner: Satisfaction with or acceptability of approach for augmented training	1; 115 therapists	Low	Unknown (single study)	Direct	Imprecise ^a	Undetected	Low for no benefit for practitioner satisfaction; calculated mean difference of G1-G3: 1.8, 95% CI, -0.423 to 4.023, p=0.11 CT group had lower satisfaction than usual care group
Intermediate outcome: Practitioner: Protocol adherence/program model fidelity	1; 115 therapists	Low	Unknown (single study)	Direct	Imprecise ^a	Undetected	Low for no benefit for various measures of protocol adherence/program model fidelity
Intermediate outcome: Practitioner: Competence/skills	1; 115 therapists	Low	Unknown (single study)	Direct	Imprecise ^a	Undetected	Low for no benefit for various measures of practitioner competence/skills

^a Small sample size/number of events; CIs cross the line of no difference.

CI = confidence interval; EBP = evidence-based practice; p = p-value.

**Table F-2. Protocol to train nurses to educate parents about EBPs versus typical services:
Detailed strength of evidence**

Outcome	Number of Studies; Subjects	Study Limitations	Consistency	Directness	Precision	Reporting Bias	Strength of Evidence Grade Magnitude of Effect
Intermediate outcome: Patient: Access to care	2; 172 parents/ caregivers in Study 1 (cohort study), 51 in Study 2 (RCT)	High	Consistent	Direct	Precise	Undetected	Low for benefit Strategy improved parent ratings of access to care (mean difference between groups ranged from 0.08 to 2.1 points in Study 1 and 0.6 to 1.9 in Study 2)
Intermediate outcome: Patient: satisfaction	2; 172 parents/ caregivers in Study 1 (cohort study), 51 in Study 2 (RCT)	High	Consistent	Direct	Precise	Undetected	Low for benefit Strategy improved parent ratings of satisfaction of care by a mean of 0.4 in Study 1 and 0.9 in Study 2
Intermediate outcome: Patient: Treatment engagement	2; 172 parents/ caregivers in Study 1 (cohort study), 51 in Study 2 (RCT)	High	Consistent	Direct	Precise	Undetected	Low for benefit Strategy improved parent ratings of treatment engagement by a mean of 0.9 in Study 1 and 2.5 in Study 2
Intermediate outcome: Patient: Therapeutic alliance with practitioner	2; 172 parents/ caregivers in Study 1 (cohort study), 51 in Study 2 (RCT)	High	Consistent	Direct	Precise	Undetected	Low for benefit Strategy improved parent ratings of therapeutic alliance by a mean of 0.4 in Study 1 and 0.9 in Study 2

EBP = evidence-based practice; RCT = randomized controlled trial.

Table F-3. Professional training to identify and refer cases versus usual care: Strength of evidence

Outcome	Number of Studies; Subjects	Study Limitations	Consistency	Directness	Precision	Reporting Bias	Strength of Evidence Grade Magnitude of Effect
Intermediate outcome: Patient: Access to care	1; 110 practices, 79 patients	High	Unknown (single study)	Direct	Imprecise ^a	Undetected	Insufficient RR of referral to early intervention: 1.20 95% CI, 0.74 to 1.95 p=0.48
Final outcome: Change in mental health status	1; 158 patients for detention under Mental Health Act, 83 patients for recovery	High	Unknown (single study)	Direct	Imprecise ^a	Undetected	Insufficient Patients in the professional training group did not have significant differences in change in mental health symptoms
Final outcome: Service utilization	1; 68 patients for number of consultations in primary care following the strategy and duration of untreated psychosis and delay in reaching early-intervention services	High	Unknown (single study)	Direct	Precise	Undetected	Low for benefit Patients in the professional training group averaged 223.8 fewer days for time from the first decision to seek care to the point of referral to an early-intervention service than patients in the control group

^aSmall sample size/number of events; CIs cross the line of no difference.

CI = confidence interval; p = p-value; RR = relative risk.

Table F-4. Professional training plus feedback to implement an EBP intervention versus professional training only to implement an EBP intervention versus control: Detailed strength of evidence

Outcome	Number of Studies; Subjects	Study Limitations	Consistency	Directness	Precision	Reporting Bias	Strength of Evidence Magnitude of Effect	Grade
Final outcome: Change in mental health status	1; 511 patients	Medium	Unknown (single study)	Direct	Precise	Undetected	Low for no benefit for both comparisons (CP-TF vs control and CP-BT vs control) CP-TF and CP-BT groups had fewer behavioral problems as rated by teachers (beta=-0.41, SE=0.16, p=0.01). There were no significant differences in teacher ratings of behavioral problems for the CP-BT vs. comparison groups or for any comparisons of behavioral problems as rated by parents.	
Final outcome: Change in socialization skills and behavior	1; 511 patients	Medium	Unknown (single study)	Direct	Precise	Undetected	Low for benefit (CP-TF vs. control) CP-TF had fewer minor assaults as reported by the child (beta=-0.25, SE=0.12, p=0.03) and social/academic competence as reported by the teacher (beta=0.35, SE=0.13, p=0.01) as compared with comparison groups. Low for no benefit (CP-BT vs. control) Minor assaults and social/academic competence did not significantly differ for the CP-BT vs. comparison groups.	

CP-BT = Coping Power-Basic Training; CP-TF = Coping Power-Training plus Feedback; EBP = evidence-based practice; p = p-value; SE = standard error.

Table F-5. Patient MMTP for practitioners versus usual care: Detailed strength of evidence

Outcome	Number of Studies; Subjects	Study Limitations	Consistency	Directness	Precision	Reporting Bias	Strength of Evidence Grade Magnitude of Effect
Intermediate outcome: Practitioner adherence	1; 2,376 patients	High	Unknown (single study)	Direct	Precise	Undetected	Low for benefit 38.3% of patients had MMT in the charts after program implementation; drop in the prevalence of SGA prescribing from 15.4% in the pre-MMTP period to 6.4% in the post-MMTP period (p<0.001)
Patient health and service utilization outcomes: Service utilization	1; 253 patients (82 before, 171 after)	High	Unknown (single study)	Direct	Precise	Undetected	Low for benefit Increased metabolic monitoring over time (level of change varies by type of monitoring)

MMT = monitoring and documentation tool; MMTP = Metabolic Monitoring Training Program; p = p-value; SGA = second-generation antipsychotic.

Table F-6. Increasing intensity of a practitioner training strategy to improve implementation of an EBP intervention: Detailed strength of evidence

Outcome	Number of Studies; Subjects	Study Limitations	Consistency	Directness	Precision	Reporting Bias	Strength of Evidence Grade Magnitude of Effect
Intermediate outcome: Practitioner adherence to CBT and monitoring techniques	1; 161 practitioners from 10 agencies	Medium	Consistent	Direct	Imprecise	Undetected	Insufficient
Intermediate outcome: Practitioner CM knowledge competence/skills	1; 161 practitioners from 10 agencies	Medium	Consistent	Direct	Imprecise	Undetected	Insufficient
Intermediate outcome: System uptake CM use by practitioner	1; 161 practitioners from 10 agencies	Medium	Consistent	Direct	Precise	Undetected	Insufficient

CBT = cognitive behavioral therapy; CM = contingency management; EBP = evidence-based practice.

Table F-7. Internet portal providing practitioner access to practice guidelines versus wait-list control: Detailed strength of evidence

Outcome	Number of Studies; Subjects	Study Limitations	Consistency	Directness	Precision	Reporting Bias	Strength of Evidence Grade Magnitude of Effect
Intermediate outcome: Practitioner—Protocol adherence/program model fidelity	1; 746 patients	Medium	Unknown (single study)	Direct	Imprecise ^a	Undetected	Low for benefit Strategy appeared to improve 4 of 5 examined outcomes that measured practitioner protocol adherence/program model fidelity outcomes (mean change in proportion of patients who received targeted, evidence-based ADHD care outcomes between groups ranged from 16.6 to -50), but estimates were very imprecise, with large CIs

^aWide CIs.

Table F-8. Weekly and cumulative 90-day feedback of patient symptoms and functioning to practitioners versus cumulative 90-day feedback of patient symptoms and functioning to practitioners only: Detailed strength of evidence

Outcome	Number of Studies; Subjects	Study Limitations	Consistency	Directness	Precision	Reporting Bias	Strength of Evidence Grade Magnitude of Effect
Intermediate outcome: Practitioner adherence	1; N of practitioners unclear	High	Unknown (single study)	Direct	Unknown ^a	Undetected	Insufficient Two-thirds did not view web modules
Patient health and service utilization outcomes: Functional severity	1; 340 youth, 144 clinicians, 383 caregivers	High	Unknown (single study)	Direct	Precise	Undetected	Low for benefit Membership in the weekly feedback group increased the rate of decline in symptoms and functioning severity scale by 0.01

^aPrecision cannot be calculated without N of practitioners.

N = number.

Table F-9. Computer decision support plus EHR that included diagnosis and treatment guidelines versus computer decision support plus EHR only: Detailed strength of evidence

Outcome	Number of Studies; Subjects	Study Limitations	Consistency	Directness	Precision	Reporting Bias	Strength of Evidence Grade Magnitude of Effect
Intermediate outcome: Practitioner adherence of completing a diagnostic assessment prior to making diagnosis	1; 84 patients (4 practices)	Medium	Unknown (single study)	Direct	Imprecise ^a	Undetected	Low for benefit ^b Adjusted OR: OR, 8.0; 95% CI, 1.6 to 40.6
Intermediate outcome: Practitioner adherence through reassessment of symptoms at 3 months, adjustment of medications, mental health referral	1; 84 patients (4 practices)	Medium	Unknown (single study)	Direct	Imprecise ^b	Undetected	Insufficient No statistically significant improvement on any measure
Intermediate outcome: Practitioner adherence through measuring ADHD symptoms at diagnosis	1; 84 patients (4 practices)	Medium	Unknown (single study)	Direct	Imprecise ^c	Undetected	Low for benefit More reporting of 3 of 4 symptom domains p<0.05
Final health outcome: Service utilization (visit to mental health specialist)	1; 84 patients (4 practices)	Medium	Unknown (single study)	Direct	Imprecise ^d	Undetected	Insufficient Calculated OR: 2.195; 95% CI, 0.909 to 5.303; p=0.081, reported p-value in study=0.054

^a Small sample size/number of events; wide CIs.

^b Large magnitude of effect.

^c Small sample size/number of events.

^d Small sample size/number of events; CIs cross the line of no difference.

ADHD = attention deficit hyperactivity disorder; CI = confidence interval; EHR = electronic health record; OR = odds ratio p = p-value.

Table F-10. IQA system versus workshop only to implement an EBP intervention: Detailed strength of evidence

Outcome	Number of Studies; Subjects	Study Limitations	Consistency	Directness	Precision	Reporting Bias	Strength of Evidence Grade Magnitude of Effect
Intermediate outcome: Practitioner adherence to CBT and monitoring techniques	1; 30 practitioners, N of caregiver and patient reports and monthly data points NR	High	Unknown (single study)	Direct	Imprecise ^a	Undetected	Insufficient Study does not provide sufficient detail to judge magnitude of effect

^aSmall sample size/number of events, CIs cannot be calculated.

CBT = cognitive behavioral therapy; EBP = evidence-based practice; IQA = intensive quality assurance; N = number; NR = not reported.

Table F-11. Collaborative consultation treatment service to promote the use of titration trials and periodic monitoring during medication management versus control: Detailed strength of evidence

Outcome	Number of Studies; Subjects	Study Limitations	Consistency	Directness	Precision	Reporting Bias	Strength of Evidence Grade Magnitude of Effect
Intermediate outcome: Practitioner adherence	1; 38 practitioners	High	Unknown (single study)	Indirect	Imprecise ^a	Undetected	Insufficient Interaction for uptake of titration trials $\beta=-0.283$; SE, 0.09; $p<0.01$ Uptake of medication monitoring trials: $p=NS$, details NR
Intermediate outcome: Practitioner competency (cited obstacles to implementation of EBPs)	1; 38 practitioners	High	Unknown (single study)	Indirect	Imprecise ^a	Undetected	Insufficient Lower odds with overlapping confidence intervals of citing obstacles in 6 of 8 measures (2 reach statistical significance)
Patient health and service utilization outcomes: ADHD symptoms	1; 144 patients	High	Unknown (single study)	Indirect	Imprecise ^a	Undetected	Insufficient F score for decrease in combined parent and teacher ratings of ADHD symptoms for group x time interaction: $F_{2, 144} = 0.44$, $p=0.65$

^aSmall sample size/number of events.

ADHD = attention deficit hyperactivity disorder; EBP = evidence-based practice; NR = not reported; NS = not significant; p = p -value; SE = standard error.

Table F-12. Paying practitioners for performance in successful delivery of an EBP intervention versus IAU: Detailed strength of evidence

Outcome	Number of Studies; Subjects	Study Limitations	Consistency	Directness	Precision	Reporting Bias	Strength of Evidence Grade Magnitude of Effect
Intermediate outcome: Practitioner: competence/skills	1; 49 therapists and 936 patients	Medium	Unknown (single study)	Indirect	Precise	Undetected	Moderate for benefit Therapists in the P4P group were over twice as likely to demonstrate implementation competence than IAU therapists (event rate ratio=2.24; 95% CI, 1.12 to 4.48)
Intermediate outcome: Practitioner: adherence/program fidelity	1; 49 therapists and 936 patients	Medium	Unknown (single study)	Indirect	Imprecise	Undetected	Low for benefit Patients in the P4P condition were over 5 times as likely to meet target implementation standards (i.e., to receive specific numbers of treatment procedures and sessions) as IAU patients (OR, 5.19; 95% CI, 1.53 to 17.62) but confidence intervals were wide.
Final outcome: Change in mental health status	1; 600	Medium	Unknown (single study)	Direct	Precise	Undetected	Low for no benefit Patients in the P4P condition did not have significantly different rates of remission at end of treatment than patients in the IAU condition

CI = confidence interval; EBP = evidence-based practice; IAU = implementation-as-usual control condition; OR = odds ratio; P4P = pay for performance.

Table F-13. Program to improve organizational culture and climate versus usual care: Detailed strength of evidence

Outcome	Number of Studies; Subjects	Study Limitations	Consistency	Directness	Precision	Reporting Bias	Strength of Evidence Grade Magnitude of Effect
Intermediate outcome: Practitioner adherence to MST (therapist and supervisor)	1; 598 youth and 297 therapists	Medium	Unknown (single study)	Direct	NR	Undetected	Low for no benefit Does not demonstrate significant improvement in any measure of adherence by ARC group (any ARC vs. no ARC)
Intermediate outcome: Practitioner satisfaction/acceptability	1; 197 practitioners in 26 programs	Medium	Unknown (single study)	Direct	Imprecise ^a	Undetected	Low for benefit Trends toward improvement in all domains, but nonoverlapping CI for only some domains (ARC vs. usual care)
Patient mental health symptoms: Out-of-home placement and child behavior problem scores at 18 months	1; 567 caregivers, 615 youth	Medium	Unknown (single study)	Direct	Precise	Undetected	Low for no benefit Difference in out of home placements between ARC only and usual care groups did not meet statistical significance ($p=0.05$) and no difference across arms (ARC only vs usual care) in behavior problem scores
Patient mental health symptoms: Child behavior problem scores each for 6 months (after organization completed 18 month implementation of program)	1; 352 caregivers of youth ages 5–18 in 18 programs	Medium	Unknown (single study)	Direct	Imprecise ^b	Undetected	Low for benefit. Lower problem behavior scores for youth in the ARC group vs. usual care

^a Small sample size/number of events; CIs cross the line of no difference for some domains.

^b Small sample size/number of events; CIs cross the line of no difference for some domains.

ARC = Availability, Responsiveness and Continuity; CI = confidence interval; MST = multisystemic therapy; NR = not reported.

Table F-14. Colocation of an EBP program in primary care versus enhanced referral to an EBP program: Detailed strength of evidence

Outcome	Number of Studies; Subjects	Study Limitations	Consistency	Directness	Precision	Reporting Bias	Strength of Evidence Grade Magnitude of Effect
Intermediate outcome: Patient access to care (attending first Triple P visit)	1; 4 pediatric practices, 20,917 children with primary care visits	High	Unknown (single study)	Direct	Precise	Unclear	Low for benefit OR, 3.10; 95% CI, 1.63 to 5.89
Patient health and service utilization outcomes: service utilization-mean number of session attended	1; 4 pediatric practices, 20,917 children with primary care visits	High	Unknown (single study)	Direct	Imprecise	Unclear	Insufficient Mean difference=-1.01; 95% CI, -2.60 to 0.58

CI = confidence interval; EBP = evidence-based practice; OR = odds ratio; Triple P = Positive Parenting Program.

Table F-15. Implementation of an EBP by pediatricians versus by embedded BHCPs: Detailed strength of evidence

Outcome	Number of Studies; Subjects	Study Limitations	Consistency	Directness	Precision	Reporting Bias	Strength of Evidence Grade Magnitude of Effect
Intermediate outcome: Practitioner adherence (assessment) to SBIRT	1; 1,255 patients of 30 pediatricians	Medium	Unknown (single study)	Direct	NR	Undetected	Low for no benefit No significant differences in substance use assessment between study arms (aOR, 0.93; 95% CI, 0.72 to 1.21)
Intermediate outcome: Practitioner adherence (brief intervention) to SBIRT	1; 1,255 patients of 30 pediatricians	Medium	Unknown (single study)	Direct	NR	Undetected	Low for benefit BHCP group patients more likely to receive brief intervention than pediatrician-only group (aOR, 1.74; 95% CI, 1.31 to 2.31)
Intermediate outcome: Practitioner adherence (referral to treatment) to SBIRT	1; 1,255 patients of 30 pediatricians	Medium	Unknown (single study)	Direct	NR	Undetected	Low for benefit BHCP group patients less likely to receive brief intervention than pediatrician-only group (aOR, 0.58; 95% CI, 0.43 to 0.78)

aOR = adjusted odds ratio; BHCP: Behavioral Health Care Provider; CI = confidence interval; EBP = evidence-based practice
NR = not reported; SBIRT = Screening, Brief Intervention, and Referral to Treatment.

Table F-16. Harms associated with professional training to identify and refer cases versus usual care: Detailed strength of evidence

Outcome	Number of Studies; Subjects	Study Limitations	Consistency	Directness	Precision	Reporting Bias	Strength of Evidence Grade Magnitude of Effect
Intermediate outcome: Patient side effects	1; 110 practices, 179 patients	High	Unknown (single study)	Direct	Unknown ^a	Undetected	Insufficient No adverse events were reported, no significant between-group differences for false-positive referral rates from primary care

^a Insufficient data to calculate precision.

Table F-17. Intensity of the strategy as a moderator of the effectiveness of the strategy: Detailed strength of evidence (intermediate outcomes)

Moderator and Outcome	Number of Studies; Subjects	Study Limitations	Consistency	Directness	Precision	Reporting Bias	Strength of Evidence Grade Magnitude of Effect
Training intensity: Patient access to care (G1: Professional training plus feedback to implement an EBP intervention, G2: Professional training only to implement an EBP intervention, G3: Control)	1; 511 patients	High	Unknown (single study)	Direct	Precise	Undetected	Low for benefit More intensive training led to improved access-to-care ratings (sessions scheduled) for both children and for parents
Training intensity: Patient treatment engagement (G1: Professional training plus feedback to implement an EBP intervention, G2: Professional training only to implement an EBP intervention, G3: Control)	1; 511 patients	High	Unknown (single study)	Direct	Precise	Undetected	Low for no benefit More intensive training associated with no differences in child or parent sessions attended or parent ratings of treatment engagement, although treatment engagement for child rated higher for more intensive training group
Training intensity practitioner protocol adherence and program fidelity (G1: Professional training plus feedback to implement an EBP intervention; G2: Professional training only to implement an EBP intervention; G3: Control)	1; 511 patients	High	Unknown (single study)	Direct	Precise	Undetected	Low for no benefit More intensive training did not lead to significant differences in mean numbers of strategy objectives completed but did lead to increases in the numbers of contacts between practitioners and trainers in the CP-TF group

CP-TF = Coping Power-Training plus Feedback; EBP = evidence-based practice; G = group.

Table F-18. Intensity of the strategy as a moderator of the effectiveness of the strategy: Detailed strength of evidence (patient health and service utilization outcomes)

Moderator and Outcome	Number of Studies; Subjects	Study Limitations	Consistency	Directness	Precision	Reporting Bias	Strength of Evidence Grade Magnitude of Effect
Training intensity: Mental health symptoms (G1: Professional training plus feedback to implement an EBP intervention; G2: Professional training only to implement an EBP intervention; G3: Control)	1; 511 patients	High	Unknown (single study)	Direct	Precise	Undetected	Low for benefit More intensive training associated with greater improvements in mental health symptoms
Training intensity: Mental health symptoms and functional status (G1: Weekly and cumulative 90-day feedback on patient symptoms and functioning to practitioners; G2: Cumulative 90-day feedback on patient symptoms and functioning to practitioners only)	1; N of practitioners unclear	High	Unknown (single study)	Direct	Unknown	Undetected	Insufficient Effect sizes for child and parent ratings of symptoms and functional status improved significantly in the more intensive training group but precision is unknown and study limitations are high
Training intensity: Mental health symptoms (G1a: Patients whose physicians did conduct a titration trial as part of a collaborative consultative treatment service to promote the use of titration trials and periodic monitoring during medication management program G1b: Patients whose physicians did not conduct a titration trial as part of a collaborative consultative treatment service to promote the use of titration trials and periodic monitoring during medication management program G2: Control)	1; 144 patients	High	Unknown (single study)	Indirect	Unknown	Undetected	Insufficient Unknown precision and high study limitations

EBP = evidence-based practice; G = group; N = number.

Table F-19. Detailed strength of evidence for moderating effect of fidelity to EBP in P4P

Outcome	Number	Study	Consistency	Directness	Precision	Reporting	Strength of
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	of Studies; Subjects	Limitations				Bias	Evidence Grade Magnitude of Effect
Final outcome: mental health symptoms (G1: Paying practitioners for performance (P4P) for successfully delivering an EBP intervention (A-CRA) G2: Implementation of an EBP intervention (A-CRA) as usual)	1; 600	Medium	Unknown (single study)	Direct	Precise	Undetected	Low for no benefit There was not a significant moderating effect of fidelity to EBP (meeting target A-CRA) on the association between treatment group and patient remission status (p=0.37)

A-CRA = Adolescent Community Reinforcement Approach; EBP = evidence-based practice; p = p-value; P4P = pay for performance.

Appendix G. Transparency of Reporting

Supplemental Project To Assess the Transparency of Reporting for Strategies To Improve Mental Health Care for Children and Adolescents

Background and Objectives for the Systematic Review

The RTI International–University of North Carolina Evidence-based Practice Center (RTI-UNC EPC) used an ongoing review, *Strategies to Improve Mental Health Care for Children and Adolescents (SIMHC)*, to generate a report on the additional information gained by including data from clinicaltrials.gov. To achieve this goal, we explored the differences between information from published and unpublished sources included in the review and clinicaltrials.gov.

In addition to this primary goal, we had three additional goals. First, we wanted to understand research and reporting requirements on a topic of increasing importance: QI, implantation, and dissemination. The volume of evidence in a range of topics will continue to rise exponentially. Despite advances in the evidence base, national health outcomes remain suboptimal, in part because of the failure of systems and providers to adopt established QI strategies and interventions with proven efficacy. Given the gap between observed and achievable processes and outcomes, the next critical step is the adoption of QI strategies and the development of strategies to implement or disseminate these interventions.¹⁻³ Closing the gap requires more information on not just outcomes of complex interventions: it requires information on study conduct and processes to allow interpretation of results and enable scale-up. To achieve this goal, we reached out to authors to understand the utility of clinicaltrials.gov and other archives (e.g., the World Health Organization [WHO] International Clinical Trials Registry and NIHReporter) for information on implementation processes.

Second, we wanted to investigate reporting lacunae in complex study designs, such as cluster randomized controlled trials (cRCTs). cRCTs require advanced analytic methods (hierarchical linear modeling, for example) that account for clustering at each level of recruitment. To date, our investigation has revealed that a substantial proportion of the included studies in the SIMHC review use cRCTs (9 cRCTs of 16⁴⁻¹⁹ included studies). However, the published data on these trials have been woefully inadequate and do always not permit an independent assessment of the effects of the intervention. These inadequacies hinder not only higher order analyses, such as risk of bias assessment, but also basic calculations of effect size and precision because of poor reporting of retention at the multiple levels of recruitment in a cRCT. To achieve this goal, we sought information from clinicaltrials.gov on more design details, and when they were not available, seek to understand the impediments to reporting through outreach to study authors.

Third, we wanted to understand impediments to publication for pragmatic trials and systems interventions. As noted above, we sought to understand the impediments to publication through outreach to study authors.

Key Questions

Our key question focus on the utility of clinicaltrials.gov for the systematic review. We also explored the additional issues (described above) that are specific to this review and complex interventions and study designs:

1. Which studies were in the EPC report alone, clinicaltrials.gov alone or in both?
2. For completed studies that were in both sources:
 - a. What were the differences, if any, in pre-specified outcome measures, statistical plan and size of the study reported, retention, study conduct, and other details of study design in the peer reviewed literature vs. clinicaltrials.gov?
 - b. Were results reported in clinicaltrials.gov for any of the studies? If they were, what were the differences, if any, in the results reported in the peer reviewed literature vs. clinicaltrials.gov?
3. For studies in clinicaltrials.gov that were not completed or discontinued:
 - a. For the discontinued studies, were there reasons given for discontinuation? If so, what were they?
 - b. For studies that are ongoing but not completed, what was the date of initiation of the studies? Are the studies proceeding according to the original schedule or is there information in clinicaltrials.gov indicating a delay in completion? If there is a delay in completion, what is the reason given?
 - c. For studies that are completed but not published, what are the reasons for delay in or lack of publication?
4. For included studies with limited or no information on study processes and conduct in clinicaltrials.gov, what, if any, publicly available sources provide or can provide information on implementation processes? What are the constraints to producing and disseminating this information? What is the perceived utility of clinicaltrials.gov as an archive for such information?
5. What is the impact on the conclusions of the EPC report with and without the information from clinicaltrials.gov? What would be the impact on the strength of evidence (including impact of knowledge of outcomes measured in studies but not reported in the peer reviewed literature)?

Methods

KQ 1

We updated our searches for SIMHC and then compare the yield with clinicaltrials.gov, using a dual independent review process.

KQ 2

- (a) For studies with information in both peer-reviewed literature and clinicaltrials.gov, we extracted and compared the results, using a dual review process, with a second reviewer checking the first abstractions.

- (b) For studies with differences in reporting by source, we reached out to study authors via email and phone interview, if necessary, to understand the reasons for the differences.

KQ 3

- (a) For discontinued studies, we planned to reach out to authors via email to identify reasons for discontinuation.
- (b) For ongoing incomplete studies, we supplemented information in clinicaltrials.gov with additional information from study authors via email.
- (c) For completed and unpublished studies, we planned to reach out to authors of discontinued studies via email to identify reasons for lack of publication

KQ 4

We reached out to authors of included studies on the reasons for use or non-use of clinicaltrials.gov or other archive sites for information on study conduct and processes.

KQ 5

We integrated the information for KQs 1-4, using data from searches; abstraction from clinicaltrials.gov; and email, personal interviews, and any additional information provided by authors. We planned to update the strength of evidence and conclusion of the SIMHC report, if we found relevant results.

Table G-1 provides the questions for email or personal interview. These are general questions, to be tailored for each interviewee. We obtained IRB exemption before conducting email interviews. We planned a minimum of two email and two telephone outreach attempts before categorizing investigators as non-responders.

We also constructed questionnaires in three additional categories but did not find studies in these categories (studies with different results reported in clinicaltrials.gov and published results, eligible discontinued studies identified via clinicaltrials.gov, and complete but unpublished studies identified via clinicaltrials.gov).

Results

Table G-2 provides the results of the outreach.

Proportion of Studies Reported in clinicaltrials.gov (KQ 1)

We identified 16 studies, reported in 16 articles^{4,19} (including two studies in a single article,⁴ and one study reported in two articles.^{10,11} Of these, nine are cRCTs,^{6-11,13-16} three are parallel-group^{4,5} or two-stage trials,¹⁷ and the remaining four are nonrandomized studies.^{4,12,18,19} Only 4—all cRCTs^{6,7,9,16}—of the 12 trials appeared in a trials registry (clinicaltrials.gov). All other studies (8 trials^{4,5,8,10,11,13-15,17} and 4 nonrandomized studies^{4,12,18,19}) did not appear in a study registry. Additionally, we found three ongoing trials in clinicaltrials.gov that have not yet published results ([NCT02097355](#), [NCT01829308](#), [NCT02271386](#)).

Table G-1. Questions for authors of studies identified for the SIMHC report or through clinicaltrials.gov

<p>The RTI-UNC Evidence-based Center is conducting a systematic review of strategies to improve mental health for children and adolescents. In addition, our funder, the Agency for Healthcare Research and Quality, has requested an additional investigation of the validity and reliability of clinicaltrials.gov as a potential additional source of information on study conduct, processes and results. Your study [xxx, has been included/is eligible for inclusion] in this review. We are reaching out to you to obtain some additional details about the reporting of your study. Thank you for agreeing to answer our questions.</p>
<p>[For authors of included clinical trials included in the report that do not have a clinicaltrials.gov listing, N=8^{4,5,8,10,11,13-15,17}]</p> <ol style="list-style-type: none"> 1. We were unable to find a listing for your study on clinicaltrials.gov. Is the study listed on clinicaltrials.gov? If yes, what is the listing number? 2. Is the study listed elsewhere on another clinical trials registry? If yes, where and what is the listing number? 3. [If the study results are not listed in any clinical trials registry] Did you attempt to list your study in a clinical trials registry? If yes, what barriers did you experience? 4. Where can other investigators find supplemental information on your study, such as your experiences with implementing the study or your assessment of critical components necessary for dissemination? 5. In abstracting your study, we noted that study arms differed in their use of [list specific components here, tailored for each study]. Which of these elements (or otherwise that we may be unaware of) do you consider to be the critical component(s) of your intervention, for those wishing to replicate your study?
<p>[For authors of clinical trials included in the report that have a listing in clinicaltrials.gov, with no results reported in clinicaltrials.gov at the time of our outreach, N=4^{6,7,9,16}]</p> <ol style="list-style-type: none"> 1. What barriers did you experience or anticipate in presenting your results in a clinical trials registry? 2. If other investigators wish to scale up your strategy, where can they find necessary information, for example, on your experience of study conduct and processes or your assessment of critical components? 3. What do you consider to be the critical components of your intervention, for those wishing to replicate your study? 4. [If such information is not available publicly or in clinicaltrials.gov] What barriers did you experience or anticipate in using a clinical trials registry to make such information available publicly?
<p>[For authors of studies included in the report that are NOT clinical trials, N=4^{4,12,18,19}]</p> <ol style="list-style-type: none"> 1. If other investigators wish to scale up your strategy, where can they find information on your experience of study conduct and processes or your assessment of critical components necessary for dissemination? 2. In abstracting your study, we noted that study arms differed in their use of [list specific components here, tailored for each study]. Which of these elements (or otherwise that we may be unaware of) do you consider to be the critical component(s) of your intervention, for those wishing to replicate your study? 3. [If such information is not available publicly] Are you aware of public registries for observational or non-randomized studies that might be relevant to your effort? If yes, what are these registries? 4. What barriers did you experience or anticipate in using registries to make information on study conduct and processes available publicly?
<p>[For authors of ongoing incomplete studies identified via clinicaltrials.gov, not included in the SIMHC review, N=3]</p> <ol style="list-style-type: none"> 1. We identified your ongoing study through a search of clinicaltrials.gov as potentially meeting our eligibility criteria for inclusion in our SIMHC review. [If clinicaltrials.gov does not provide this information] What is the anticipated date of completion for this study? 2. We identified your study through a search of clinicaltrials.gov as potentially meeting our eligibility criteria for inclusion in our SIMHC review. Are there plans to publish the findings? If yes, where will you attempt to publish the material? If no, why not? 3. Is there any addition information or data that you could share with us that is not currently included on clinicaltrials.gov for this study? [If relevant] 4. Your experience of study conduct and processes may be valuable to others attempting a similar strategy. Where can other investigators find such information? 5. [If relevant] What barriers did you experience or anticipate in using a clinical trials registry to make such information available publicly?

Table G-2. Transparency of reporting: summary of results of outreach to study investigators

Author	Available on clinical-trials.gov	Available on other registries	Outcomes available on registry	Barriers to registering study	Barriers to presenting information on critical components on registries	Availability of materials for replication	Critical components for replication as identified by study authors
Beidas et al., 2012 ⁵	No	No	NA	Not a traditional clinical trial in that it focused on changing clinician behavior and did not enroll patients; therefore did not attempt to include it on the clinical trials registry.	NA	In existing publications on the trial	Augmented training: focus on principles of treatment and use of experiential learning; the ongoing support and consultation
Bickman et al., 2011 ¹⁶	Yes	No	No	None	Not perceived as necessary because author did not experience barriers in dissemination through routine outlets such as publications and presentations	NA	Feedback
Carroll et al., 2013 ⁶	Yes	NR	Yes	NR	NR	NR	NR
Epstein et al., 2011 ⁷	Yes	No	No	clinicaltrials.gov is made for pharmaceutical clinical trials and was very difficult to complete some of the fields for this non-pharmaceutical study. It required an extended call with tech support at clinicaltrials.gov to get results posted correctly.	None but noted no community-based pediatricians has contacted author through clinicaltrials.gov.	NA	1. an internet based platform through which parents, teachers, and pediatricians all input information about the target child during initial ADHD assessment and treatment, which then resulted in a report 2. change in office flow
Epstein et al., 2007 ⁸	No	No	NA	No barriers noted but the authors did not attempt registration because it was not mandated at the start of the trial	NA	Published materials or contact authors	Recruitment of patients from community-based pediatric practices.

Table G-2. Transparency of reporting: summary of results of outreach to study investigators (continued)

Author	Available on clinical-trials.gov	Available on other registries	Outcomes available on registry	Barriers to registering study	Barriers to presenting information on critical components on registries	Availability of materials for replication	Critical components for replication as identified by study authors
Garner et al., 2012 ⁹	Yes	No	No	None given that clinicaltrials.gov automatically indexed publications via the ClinicalTrials.gov Identifier	A study registry could serve as a repository but unclear whether it could be used for this purpose.	None	Financial incentives provided to the staff delivering the intervention
Glisson et al., 2012 ^{10,11}	No	No	NA	Did not attempt registration so no barriers noted	NA	Publications, website, intervention training materials	The ARC intervention strategies depend on trained specialists who work at all levels of a service system to: (a) embed guiding principles for improving services, (b) develop shared mental models among organizational members to support the improvement effort, and (c) enact organizational tools (e.g., feedback) for identifying and addressing service barriers.
Glisson et al., 2010 ¹⁷	No	No	NA	Did not attempt registration so no barriers noted	NA	Publications, website, intervention training materials	The ARC intervention strategies depend on trained specialists who work at all levels of a service system to: (a) embed guiding principles for improving services, (b) develop shared mental models among organizational members to support the improvement effort, and (c) enact organizational tools (e.g., feedback) for identifying and addressing service barriers.
Gully et al., 2008 ⁴ (study 1)	No	NR	NR	NR	NR	NR	NR
Gully et al., 2008 ⁴ (study 2)	No	NR	NR	NR	NR	NR	NR

Table G-2. Transparency of reporting: summary of results of outreach to study investigators (continued)

Author	Available on clinical-trials.gov	Available on other registries	Outcomes available on registry	Barriers to registering study	Barriers to presenting information on critical components on registries	Availability of materials for replication	Critical components for replication as identified by study authors
Henggeler et al., 2008 ¹²	No	NR	NR	NR	NR	NR	NR
Henggeler et al., 2013 ¹³	No	NR	NR	NR	NR	NR	NR
Lester et al., 2009 ¹⁴	No	NR	NR	NR	NR	NR	NR
Lochman et al., 2009 ¹⁵	No	No	NA	Did not attempt registration so no barriers noted	NA	Contact authors	audit and feedback components where trainers reviewed the rate of completion of session objectives and provided individualized supervisory feedback
Ronsley et al., 2012 ¹⁹	No	NR	NR	NR	NR	NR	NR
Wildman et al., 2012 ¹⁸	No	NA	NA	NA	NA	Contact authors	Creating easy referral procedures for primary care providers to use for behavioral health care.

Abbreviations: NA = not applicable; NR = not reported

Comparing Data Between clinicaltrials.gov and Published Sources (KQ 2)

Three of four studies that had been registered in clinicaltrials.gov did not report results ([NCT01308879](#),¹⁶ [NCT01016704](#),⁹ and [NCT01056016](#)⁷). One study updated the clinicaltrials.gov registry with results after we sent out a query to the authors ([NCT01351064](#)⁶). The results did not differ between the publication and the registry, with one exception. In the publication, the authors present an adjusted odds ratio for the use of structured diagnostic assessments, of 8.0 (95% CI, 1.6 to 40.6). In clinicaltrials.gov, the authors provide raw data rather than adjusted results. Using these data, we calculated an unadjusted odds of 6.9 (95 CI%, 2.6 to 18.6).

Incomplete or Discontinued Studies (KQ 3)

We reached out to investigators of three ongoing studies ([NCT02097355](#), [NCT01829308](#), and [NCT02271386](#)). Two did not note barriers to registering their trials, but a third noted difficulties arising from the required data entry fields in clinicaltrials.gov, which are not designed for implementation trials.

We found no discontinued studies.

Utility of Trial Registries for Disseminating Information on Study Outcomes and Processes (KQ 4)

As noted in Table G-2, three investigators (lead investigators on two studies and one proxy for two studies with a deceased principal investigator) did not respond to our repeated outreach attempts. A fourth respondent refused because of lack of time and a fifth responded to us but was unable to provide us with information because the principal investigator (lead on two studies) was deceased. Of the remaining nine investigators who completed the questionnaires, six did not attempt to register the study on clinicaltrials.gov and therefore noted no barriers. Two of three respondents who registered their study noted no barriers, with one noting that clinicaltrials.gov automatically indexed publications via the ClinicalTrials.gov Identifier. A third noted barriers arising from a mismatch between the nature of the trial and the purpose of clinicaltrials.gov, which was designed for pharmaceutical trials. We asked these three respondents about the utility of adding information on critical components to registries. Two expressed doubts about the utility of clinicaltrials.gov for housing such information and one did not perceive a need for clinicaltrials.gov to house such information.

Discussion

Impact of Results on EPC Report (KQ 5)

Table G-2 lists the critical components of the study, as identified by study authors. As noted previously, a significant constraint in understanding the results of studies of complex interventions is that they frequently involve complex designs and multiple components. Outreach to study investigators can potentially shed light on critical components that are not otherwise identified in the literature. Ideally, this information can be used to cluster and analyze studies in a systematic review to generate insights and effect estimates from the overall body of evidence. Although we were able to update the report with additional information on critical components in the study descriptors table, our efforts did not result in sufficient information to alter the EPC report materially, for a few reasons. First, despite multiple attempts to reach out to investigators, we had a 54 percent completion rate (we received responses for 9 of 16 studies). Second, among those who responded, use of clinicaltrials.gov was very limited. Only one author posted results in clinicaltrials.gov, and those results did not differ substantively from what was otherwise available to us. Third, investigators who responded may have interpreted our questions in varying ways. Fourth, because of the email format of our outreach, we could not ask followup questions.

Utility of clinicaltrials.gov for Systems Interventions

The limited utility of clinicaltrials.gov for supplementing information in this report arises from three sources. First, clinicaltrials.gov is not designed or a good fit for implementation studies. Authors who attempt to register studies on their own reported difficulties. Second, authors did not generally report findings on clinicaltrials.gov. Third, authors do not perceive a need for using clinicaltrials.gov to house information vital to the next generation of implementation studies on the critical components of their interventions.

Next Steps

Complex systems interventions and complex study designs such as those covered by this systematic review urgently require substantial documentation of design, processes, and outcomes. Current methods of dissemination simply do not provide sufficient detail at the present time to fully understand or synthesize these interventions and replicate them. As research teams splinter or change trajectories, this information is potentially lost forever (as we inferred from our attempts to reach some authors). At the present time, clinicaltrials.gov does not appear to offer a viable solution to house such information for two reasons: first, the site is not designed for implementation studies and second, authors do not perceive that their audience will seek such information from clinicaltrials.gov. The most viable alternative to enhancing transparency of reporting for these interventions appears to be through journal requirements such as TIDieR.²⁰

In the short term, enhanced searches of clinicaltrials.gov and outreach to authors appear to offer limited utility for systematic reviews of complex systems interventions. On the other hand, as the main body of our report indicates, we found that studies of related publications (“sibling” studies of the same intervention, or searches of authors of included interventions) can substantially enhance the descriptions and interpretation of studies. These sibling studies are not available, however, for all included studies and cannot serve as a comprehensive and universal sources of information.

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Appendix H. Qualitative Comparative Analysis

Specific analytic steps are described below:

1. **Specifying the configural questions.** For this review, we asked “what combination of intervention components is present in studies demonstrating improved implementation, dissemination, quality improvement?”
2. **Identifying cases for use in analysis.** All included studies had at least two arms but did not always provide information on arm-specific improvements. Therefore, we could not include each arm in each study as a case; rather, each case constituted a comparison between two study arms. A study with three arms provided two cases for analysis.
3. **Specifying and calibrating condition sets.** In this step, we planned to examine several causal conditions. Specifically, we focused on intervention components as defined by the taxonomy used by the international Cochrane Review Group’s EPOC Group to classify complex strategies designed to improve health care professionals’ practice and the organization of health care services.¹ We classified studies based on whether study arms differed with respect to at least one professional component (e.g., distribution of educational materials, educational meetings, audit and feedback), at least one financial component (provider financial components such as provider incentives and provider grants or allowances and patient financial components such as patient incentives), and at least one organizational component (both provider-oriented organizational components such as clinical multidisciplinary teams and provider satisfaction, as well as structural organizational components such as changes in scope and nature of benefits and services, staff organization, and presence and organization of quality monitoring mechanisms). With 17 included studies, we needed to limit the number of conditions we could test. Because QCA examines all possible combinations of conditions, adding conditions to a model increases the number of possible combinations exponentially (by 2 to the k th power, where k is the number of conditions. Thus, 3 conditions produce 8 combinations, 4 conditions produce 16 combinations, and so on).
 - a. In QCA, condition (and outcome) sets are calibrated by establishing thresholds and decision rules for membership in a condition. In a crisp set, a value of 1 indicates that a case is fully in the condition set; a value of 0 indicates that a case is fully out of a condition set. In keeping with the definition of cases as comparisons between two arms, we defined conditions as differences between two arms. We used the EPOC taxonomy to classify main intervention components, dually and independently, and resolved conflicts after consensus. A value of 0 indicated there was no difference between the arms in that component. A value of 1 meant that the arms varied in that component. For example, cases assigned a condition value of 1 for financial components had at least one financial component (such as pay for performance) that the control arm did not have. Table H-1 illustrates the criteria used to assess each condition set. Two models with different outcomes but the same set of tested components were tested. We used crisp sets (0 vs. 1) instead of fuzzy sets, which can have continuous values, because the conditions of interest aligned with a dichotomous scoring.

Table H-1. Condition and outcome definitions and calibration specifications for QCA intervention components and outcomes

Condition or Outcome	Definition	Calibration
Condition: Study arms differed by the presence of a specific professional component: Educational materials or meetings	Differences between arms include at least one professional educational materials or meetings component; component is a major part of strategy tested in the study	Fully In (score=1.0): At least one professional educational materials/meetings component differs between study arms. Fully Out (score=0.0): No professional educational materials/meetings components differ between study arms
Condition: Study arms differed by the presence of a specific professional component: Educational outreach visits	Differences between arms include at least one professional educational outreach visits component; component is a major part of strategy tested in the study	Fully In (score= 1.0): At least one professional educational outreach visits component differs between study arms Fully Out (score=0.0): No professional educational outreach components differ between study arms
Condition: Study arms differed by the presence of a specific professional component: Audit and feedback	Differences between arms include at least one professional audit and feedback component; component is a major part of strategy tested in the study	Fully In (score=1.0): At least one professional audit and feedback component differs between arms Fully Out (score=0.0): No professional audit and feedback components differ between study arms
Condition: Study arms differed by the presence of a specific professional component: Reminders	Differences between arms include at least one professional reminders component; component is a major part of strategy tested in the study	Fully In (score=1.0): At least one professional reminders component differs between study arms Fully Out (score=0.0): No professional reminders components differ between study arms
Condition: Study arms differed by the presence of at least one financial component	Differences between arms include at least one financial component; component is a major part of strategy tested in the study	Fully In (score=1.0): At least one financial component differs between study arms Fully Out (score=0.0): No financial components differ between study arms
Condition: Study arms differed by the presence of having clinical multidisciplinary teams (an organizational-provider component)	Differences between arms include at least one clinical multidisciplinary teams component; component is a major part of strategy tested in the study	Fully In (score=1.0): At least one clinical multidisciplinary teams component differs between study arms Fully Out (score=0.0): No clinical multidisciplinary teams components differ between study arms
Condition: Study arms differed by the presence of a changing the scope of patient benefits component	Differences between arms include at least one changing the scope of patient benefits component; component is a major part of strategy tested in the study	Fully In (score=1.0): At least one changing the scope of patient benefits component differs between study arms Fully Out (score=0.0): No changing the scope of patient benefits components differ between study arms

Table H-1. Condition and outcome definitions and calibration specifications for QCA intervention components and outcomes (continued)

Condition or Outcome	Definition	Calibration
Outcome: Significant improvement in majority of practitioner, system, or patient intermediate outcomes	Between-arm intermediate outcome differs statistically significantly between intervention and control (or more vs. less intense arms) for a majority of intermediate outcomes tested	Fully In (score= 1.0): A majority of practitioner-, system-, and patient-level intermediate outcomes showed statistically significant improvements Fully Out (score=0.0): A majority of intermediate outcomes tested did not show statistically significant improvements across study arms
Outcome: Significant improvement in majority of practitioner, system, or patient intermediate outcomes <u>OR</u> significant improvement in majority of patient or health care utilization outcomes	Between-arm outcome differs statistically significantly between intervention and control (or more vs. less intense arms) for a majority of intermediate outcomes tested <u>OR</u> for majority of patient/health care utilization outcomes tested	Fully In (score=1.0): A majority of practitioner-, system-, and patient-level intermediate outcomes <u>OR</u> a <u>majority of patient/health care utilization outcomes</u> showed statistically significant improvements Fully Out (score=0.0): A majority of intermediate outcomes <u>AND</u> patient/health care utilization outcomes tested did not show statistically significant improvements across study arms

QCA = **Qualitative Comparative Analysis**.

- b. We tested models defined by the presence or absence of at least one educational materials or meetings component, at least one educational outreach component, at least one patient-mediated intervention component, at least one audit and feedback component, at least one reminders component, at least one financial component, at least one changing clinical multidisciplinary teams component, and at least one changing the scope of patient benefits component.
4. **Specifying and calibrating outcome set.** We assessed “having evidence of improvement” as our outcome set. Table H-3 illustrates the criteria used to assess each outcome. We evaluated two outcomes to test in our models that contained the condition sets defined above:
 - a. A majority of practitioner-, system-, and patient-level intermediate outcomes showing statistically significant improvement between study arms and showing at least low strength of evidence for benefit
 - b. A super outcome defined as having a majority of practitioner-, system-, and patient-level intermediate outcomes showing statistically significant improvement between study arms OR at least one patient health or health care utilization outcome showing at least low strength of evidence for benefit between study arms

As with calibration of the condition set, we dually and independently calibrated each outcome set and resolved conflicts after consensus. We assigned a value of 1 (fully in the set of achieving our outcome of interest), indicating evidence of improvement. We assigned a value of 0 (fully out of the set of achieving implementation effectiveness as defined by our outcome of interest, indicating no evidence of improvement) to cases that did not demonstrate a statistically significant improvement in outcome between arms.

5. **Constructing and analyzing the truth table.** The truth table, the key analytic device in QCA, helps determine which combinations of conditions occur consistently with

improvement. We used R Set Methods and QCA packages² to identify solutions (i.e., combinations of conditions that are necessary or sufficient for the outcomes). This analysis also included examination of parameters of fit: consistency and coverage. *Consistency* assesses whether the causal pathway produces the outcome regularly (“the degree to which the empirical data are in line with a postulated subset relation”);^{3, p. 324} in crisp sets, consistency indicates the proportion of cases that achieved an outcome in an individual solution or across solutions for total solution consistency. *Coverage* determines the empirical relevance of a solution and quantifies the variation in causal pathways to an outcome (analogous to variance explained, or how well the solutions explain outcomes across all included cases). The results of a QCA analysis are statements of necessity and sufficiency, expressed as text, as solution formulas, or in tabular or graphic formats. We assessed each individual condition for necessity and sufficiency, examined the necessary and sufficient combinations of conditions that resulted in significant improvements, and calculated consistency and coverage. In our analysis of combinations, we ran the conservative, intermediate, and parsimonious solutions, as well as the negation of the outcome. We implemented a .80 consistency level for including combinations in the final minimization; we also tested for robustness at 0.75 and 0.90. As is typical in QCA practice, we report the intermediate solution. The conservative and parsimonious solutions, which are a subset and a superset (respectively) of the intermediate solution, are available on request.

6. **Making sense of the results.** We returned to the included studies to evaluate the identified solutions and understand the contextual elements that might explain these solutions.

Table H-2. QCA inputs for each condition set and outcome examined for each included study (Part 1)

Study Authors	Fully In (score=1.0): At least one educational materials or educational meeting component differs between study arms	Fully In (score=1.0): At least one educational outreach visit component differs between study arms	Fully In (score=1.0): At least one patient-mediated intervention component differs between study arms	Fully In (score=1.0): At least one audit and feedback component differs between study arms	Fully In (score=1.0): At least one reminders component differs between study arms	Fully In (score=1.0): At least one financial component differs between study arms	Fully In (score=1.0): At least one clinical multidisciplinary teams component differs between study arms
	Fully Out (score=0.0): No educational materials or meetings components differ between arms	Fully Out (score=0.0): No educational outreach components differ between arms	Fully Out (score=0.0): No patient-mediated intervention components differ between arms	Fully Out (score=0.0): No audit and feedback components differ between arms	Fully Out (score=0.0): No reminders components differ between arms	Fully Out (score=0.0): No financial components differ between arms	Fully Out (score=0.0): No clinical multidisciplinary teams components differ between arms
Beidas et al., 2012 G1 vs. G3 ⁴	1	0	0	0	0	0	0
Beidas et al., 2012 G2 vs. G3 ⁴	1	0	0	0	0	0	0
Bickman et al., 2011 ⁵	0	0	0	1	0	0	0
Carroll et al., 2013 ⁶	1	0	1	0	1	0	0
Epstein et al., 2011 ⁷	1	0	1	1	1	0	1
Epstein et al., 2007 ⁸	0	0	0	1	1	1	0
Garner et al., 2012 ⁹	0	0	0	0	0	1	0
Glisson et al., 2012 ¹⁰	1	1	0	1	0	0	0

Table H-2. QCA inputs for each condition set and outcome examined for each included study (Part 1) (continued)

Study Authors	Fully In (score=1.0): At least one educational materials or meeting component differs between study arms	Fully In (score=1.0): At least one educational outreach visit component differs between study arms	Fully In (score=1.0): At least one patient-mediated intervention component differs between study arms	Fully In (score=1.0): At least one audit and feedback component differs between study arms	Fully In (score=1.0): At least one reminders component differs between study arms	Fully In (score=1.0): At least one financial component differs between study arms	Fully In (score= 1.0): At least one clinical multidisciplinary teams component differs between study arms
	Fully Out (score=0.0): No educational materials or meetings components differ between arms	Fully Out (score=0.0): No educational outreach components differ between arms	Fully Out (score=0.0): No patient-mediated intervention components differ between arms	Fully Out (score=0.0): No audit and feedback components differ between arms	Fully Out (score=0.0): No reminders components differ between arms	Fully Out (score=0.0): No financial components differ between arms	Fully Out (score=0.0): No clinical multidisciplinary teams components differ between arms
Glisson et al., 2010 ¹¹	1	0	1	0	0	0	0
Gully et al., 2008 Study 1 ¹²	1	1	0	0	0	0	0
Gully et al., 2008 Study 2 ¹²	1	1	0	0	0	0	0
Henggeler et al., 2008 ¹³	0	0	0	0	0	0	0
Henggeler et al., 2013 G1 vs. G3 ¹⁴	1	0	0	0	0	0	0
Henggeler et al., 2013 G2 vs. G3 ¹⁴	1	0	0	0	0	0	0
Lester et al., 2009 ¹⁵	1	0	0	0	0	0	0

Table H-2. QCA inputs for each condition set and outcome examined for each included study (Part 1) (continued)

Study Authors	Fully In (score=1.0): At least one educational materials or educational meeting component differs between study arms	Fully In (score=1.0): At least one educational outreach visit component differs between study arms	Fully In (score=1.0): At least one patient-mediated intervention component differs between study arms	Fully In (score=1.0): At least one audit and feedback component differs between study arms	Fully In (score=1.0): At least one reminders component differs between study arms	Fully In (score=1.0): At least one financial component differs between study arms	Fully In (score= 1.0): At least one clinical multidisciplinary teams component differs between study arms
	Fully Out (score=0.0): No educational materials or meetings components differ between arms	Fully Out (score=0.0): No educational outreach components differ between arms	Fully Out (score=0.0): No patient-mediated intervention components differ between arms	Fully Out (score=0.0): No audit and feedback components differ between arms	Fully Out (score=0.0): No reminders components differ between arms	Fully Out (score=0.0): No financial components differ between arms	Fully Out (score=0.0): No clinical multidisciplinary teams components differ between arms
Lockman et al., 2009 ¹⁶ G1 vs. G3	1	0	0	1	0	0	0
Lockman et al., 2009 ¹⁶ G2 vs. G3	1	0	0	0	0	0	0
Ronsley et al., 2012 ¹⁷	1	1	0	0	1	0	0
Sterling et al., 2015 ¹⁸	0	0	1	0	0	0	1
Wildman et al., 2012 ¹⁹	0	0	1	0	0	0	0

G = group; QCA = **Qualitative Comparative Analysis**; vs = versus.

Table H-3. QCA inputs for each condition set and outcome examined for each included study (Part 2)

Study Authors	Fully In (score=1.0): At least one provider satisfaction with conditions of work component differs between study arms	Fully In (score=1.0): At least one quality monitoring component differs between arms	Fully In (score=1.0): At least one changing the scope of patient benefits component differs between study arms	<u>OUTCOME</u> <u>(Intermediate):</u> Fully In (score=1.0): A majority of practitioner-, system-, and patient-level intermediate outcomes showed statistically significant improvements across study arms	<u>OUTCOME (Super [Intermediate or Patient Health/Service Utilization]):</u> Fully In (score=1.0): A majority of practitioner-, system-, and patient-level intermediate outcomes or at least one patient health or service utilization outcomes showed low strength of evidence for benefit across study arms
	Fully Out (score=0.0): No provider satisfaction with conditions of work components differ between arms	Fully Out (score=0.0): No quality monitoring components differ between arms	Fully Out (score= 0.0): No changing the scope of patient benefits components differ between arms	Fully Out (score=0.0): A majority of intermediate outcomes tested did not show statistically significant improvements across study arms	Fully Out (score=0.0): A majority of intermediate outcomes did not show statistically significant improvements and at least one patient health or service utilization outcome tested did not show at least low strength of evidence for benefit across study arms
Beidas et al., 2012 G1 vs. G3 ⁴	0	0	0	0	0
Beidas et al., 2012 G2 vs. G3 ⁴	0	0	0	0	0
Bickman et al., 2011 ⁵	0	0	0	0	1
Carroll et al., 2013 ⁶	0	1	0	1	1
Epstein et al., 2011 ⁷	0	1	0	1	1
Epstein et al., 2007 ⁸	0	0	0	0	0
Garner et al., 2012 ⁹	0	0	0	1	1
Glisson et al., 2012 ¹⁰	1	0	0	1	1
Glisson et al., 2010 ¹¹	1	0	0	0	0
Gully et al., 2008 Study 1 ¹²	0	0	0	1	1
Gully et al., 2008 Study 2 ¹²	0	0	0	1	1
Henggeler et al., 2008 ¹³	0	1	0	0	0
Henggeler et al., 2013 G1 vs. G3 ¹⁴	0	0	0	0	0

Table H-3. QCA inputs for each condition set and outcome examined for each included study (Part 2) (continued)

Study Authors	Fully In (score=1.0): At least one provider satisfaction with conditions of work component differs between study arms	Fully In (score=1.0): At least one quality monitoring component differs between arms	Fully In (score=1.0): At least one changing the scope of patient benefits component differs between study arms	<u>OUTCOME</u> <u>(Intermediate):</u> Fully In (score=1.0): A majority of practitioner-, system-, and patient-level intermediate outcomes showed statistically significant improvements across study arms	<u>OUTCOME (Super [Intermediate or Patient Health/Service Utilization]):</u> Fully In (score=1.0): A majority of practitioner-, system-, and patient-level intermediate outcomes or at least one patient health or service utilization outcomes showed low strength of evidence for benefit across study arms
	Fully Out (score=0.0): No provider satisfaction with conditions of work components differ between arms	Fully Out (score=0.0): No quality monitoring components differ between arms	Fully Out (score= 0.0): No changing the scope of patient benefits components differ between arms	Fully Out (score=0.0): A majority of intermediate outcomes tested did not show statistically significant improvements across study arms	Fully Out (score=0.0): A majority of intermediate outcomes did not show statistically significant improvements and at least one patient health or service utilization outcome tested did not show at least low strength of evidence for benefit across study arms
Henggeler et al., 2013 G2 vs. G3 ¹⁴	0	0	0	0	0
Lester et al., 2009 ¹⁵	0	0	0	0	1
Lockman et al., 2009 ¹⁶ G1 vs. G3	0	0	0	N/A	1
Lockman et al., 2009 ¹⁶ G2 vs. G3	0	0	0	N/A	0
Ronsley et al., 2012 ¹⁷	0	0	0	1	1
Sterling et al., 2015 ¹⁸	0	0	0	1	1
Wildman et al., 2012 ¹⁹	0	0	1	1	1

G = group; N/A = not applicable; QCA = **Qualitative Comparative Analysis**; vs = versus.

Table H-4. Truth table

Study Authors	Having an Educational Materials or Meetings Component	Having a Patient-Mediated Intervention Component	Having an Educational Outreach Component	Having an Audit and Feedback Component	Having a Financial Component	Having a Clinical Multi-disciplinary Teams Component	Having a Changes in Scope of Patient Benefits Component	Having a Reminder Component	# of Studies in the Combination	Consistency
Beidas et al., 2012 ⁴ G1 vs. G3 and G2 vs. G3; Henggeler et al., 2013 ¹⁴ G1 vs G3; Lockman et al., 2009 ¹⁶ G2 vs. G3	1	0	0	0	0	0	0	0	4	1.000
Gully et al., 2008 ¹² Study 1 and Study 2;	1	1	1	0	0	0	0	0	2	1.000
Henggeler et al., 2013 ¹⁴ G1 vs G3; Lester et al., 2009 ¹⁵	1	0	1	0	0	0	0	0	2	0.500
Glisson et al., 2012 ¹⁰ , Glisson et al., 2010 ¹¹	1	0	1	1	0	0	0	0	2	0.500
Wildman et al., 2012 ²⁰	0	0	0	0	0	0	1	0	1	1.000
Sterling et al., 2015 ¹⁸	0	0	0	0	0	1	0	0	1	1.000
Garner, 2012 ⁹	0	0	0	0	1	0	0	0	1	1.000
Bickman et al., 2011 ⁵ ;	0	0	0	1	0	0	0	0	1	1.000
Lockman et al., 2009 ¹⁶ G1 vs. G3	1	0	0	1	0	0	0	0	1	1.000

Table H-4. Truth table (continued)

Study Authors	Having an Educational Materials or Meetings Component	Having a Patient-Mediated Intervention Component	Having an Educational Outreach Component	Having an Audit and Feedback Component	Having a Financial Component	Having a Clinical Multi-disciplinary Teams Component	Having a Changes in Scope of Patient Benefits Component	Having a Reminder Component	# of Studies in the Combination	Consistency
Ronsley et al., 2012 ¹⁷	1	0	1	0	0	0	0	1	1	1.000
Carroll et al., 2013 ⁶	1	1	0	0	0	0	0	1	1	1.000
Epstein et al., 2011 ⁷	1	1	0	1	0	0	0	1	1	1.000
Henggeler et al., 2008 ¹³	0	0	0	0	0	0	0	0	1	1.000
Epstein et al., 2007 ⁸	0	0	0	1	0	1	0	0	1	1.000

NOTE: Combinations of condition sets not found in any included study are not shown (e.g., no study included professional and financial condition sets but not organizational provider and not organizational structural).

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